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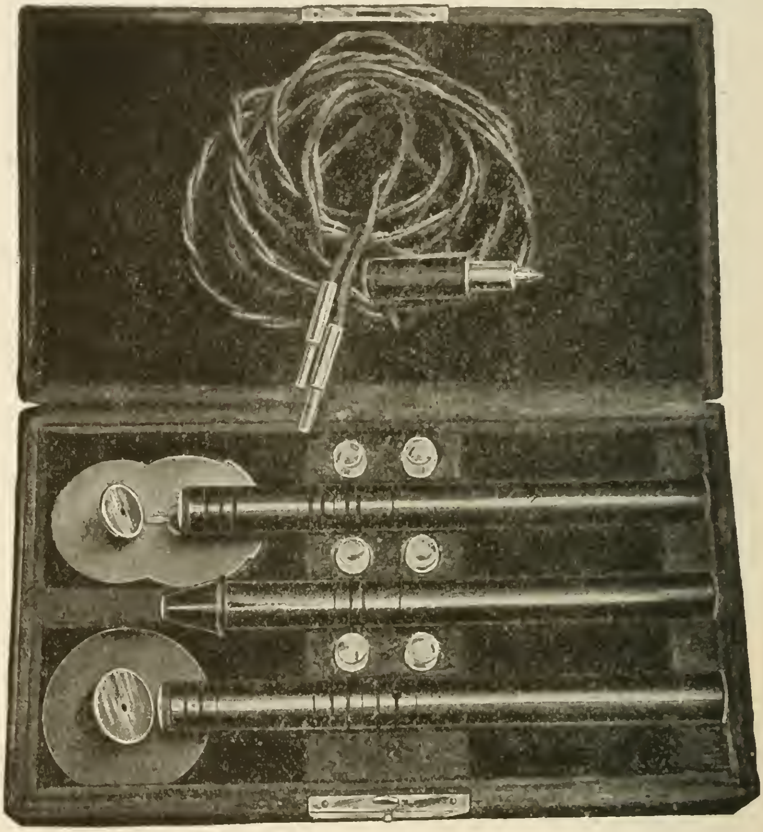

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# OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS.

VOL. 5. OCTOBER, 1908. NO. 1.

## *Original Articles.*

## THE ARTIFICIAL ILLUMINATION OF SCHOOL ROOMS.*

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(Illustrated.)

The fact that school rooms are improperly illuminated is brought to the attention of every ophthalmologist by the number of young men who appear in his consulting room every year upon their return from boarding schools, complaining of trouble in the use of the eyes, which they attribute almost universally to insufficient illumination in the room in which they are obliged to study, or to annoyance from points of brilliant illumination which are within their fields of vision. The same story is related by others who attend evening schools, and who nearly always allege that the light is insufficient.

A properly arranged light for the purpose of study upon a single desk is not difficult. It is evident that there should be sufficient light, that it must come from the left side in order that the shadow of the pen shall not fall upon the words as they are written, that the light should be so placed as not to be directly reflected from the paper into the eyes of the student, and that the general illumination of the room should be nearly as great as that upon the paper or book in order to prevent too great a contrast. It is well that the light on the book should be slightly dominant over that of the general illumination, but that the contrast should not be too great; in other words, the central point in the field of vision should not be much more brilliantly illuminated than the periphery of the field. The greater in excess of such a standard is the amount of illumination upon the book, the greater will be the discomfort.

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*Read before the American School Hygiene Association, Atlantic City, N. J., April 17, 1908.

In the school room the problem is much more complicated. Here we desire to have the illumination the same as in the case of the single desk, but there are from forty to sixty desks that have to derive their illumination from fixtures which can in no way be arranged for the proper illumination of a single desk. The first requisite for successful illumination in the school room, as elsewhere, is that the general illumination shall be good. This necessarily depends upon the decoration of the room. If the walls, desks and other furnishings are so dark that practically they reflect no light, then any method of arranging the lighting apparatus will always be unsuccessful. This phase of the matter is one that is of great importance at the present time when it is the fashion to give all libraries and even many school rooms an exceedingly dark tone. The tables and desks are made of dark oak or cherry, walls are decorated in dark reds or greens, the bookcases are often of Flemish oak to give the same general effect, with the result that sufficient light can never be reflected from the walls to diminish the striking contrast between the illuminated page and the surrounding objects. The attempt is often made to remedy this defect by increasing the amount of illumination. This always fails to produce the desired comfort on account of the intense contrast established. All school rooms are used by day as well as by night, and the decoration of the walls must be such that they will not reflect too much daylight, as would be the case if the walls were left white, nevertheless, they must reflect sufficient light at night to give a good general illumination. Perhaps the best color for this purpose is an exceedingly pale yellow green, very nearly white; or if the room is too dark by day a pale buff serves the purpose by day and night better than any other color. The window shades should be given consideration. In the modern school room the areas of the windows are usually one-fifth of the floor space, and if shades are installed which transmit light too freely, the illuminated areas of the windows may be annoying. If, on the other hand, the shades are absolutely opaque, they diminish to too great an extent the amount of light on the opposite side of the room. The best shade with which I am acquainted is a "hand-painted" gray green. This will exclude the direct rays of the sun sufficiently, yet transmit enough light to enable the whole area of the window to be a source of illumination. It is fortunate that this shade is also a proper color to be of use at night. As has been stated above, the comfortable use of the eyes depends on proper diffusion and reflection of light from the walls, and if one side of the room having an area equal to one-fifth of the floor space is left without shades at night, showing from within an absolutely black space, there is a great loss in the amount of illumination, but if "hand-painted" shades of this color are used and are drawn at night, they afford a sufficiently good reflecting surface to give an even illumination in the room. Next in importance is the material and color of the desks and other furniture. If the desks are dark they will reproduce the common fault of a brilliantly illuminated white page in the center of the field and less illumination in the periphery. Therefore, it is necessary that the desks and other furniture should be of some light colored wood, and it is of importance also that the surface of the desk should not be polished. A great stumbling block in the way of proper decoration of school rooms from an illuminating as well as decorative point of view, is the blackboard. This generally extends around two sides of the room and consists of a broad black area nearly on a level with the eyes of the children in the seats, and if it always remained black it would be more harmful than it is. As a matter of fact, the surface when in use is generally covered with a fine layer of chalk, giving a grayish tint, which does reflect a considerable amount of light. In my opinion the blackboard is an anachronism in the modern school room, and some substitute should be devised which will reflect more light and tone in better with the general decoration.

Whatever means of artificial illumination we adopt in a modern school room the following factors should be considered: The amount of contamination of the air produced by the effects of combustion, the amount of heat given off, the steadiness of the light, the harm which comes from having bright points of intrinsic brilliancy within the fields of vision of the teacher and pupils, whether the spectrum contains a large proportion of injurious rays, the cost of supplying the light, the cost of fixtures, the ease with which they can be kept in order and clean, and last, but not least, whether a uniform amount of illumination can be maintained upon all the desks.

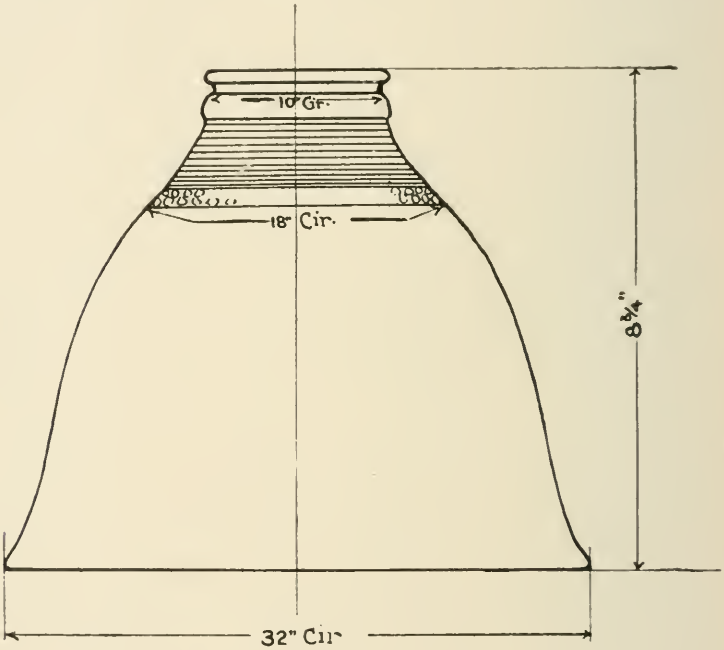
In Germany and elsewhere, an attempt has been made to secure as many of these desiderata as possible by indirect illumination, that is, by having the source of light screened entirely from below and reflected upon the ceiling and the upper third of the walls; thence it is diffused throughout the room. Such a method of illumination when properly arranged, gives an impression much akin to daylight, but it lacks one important factor of daylight, namely, shadows, and as we are so accustomed to depend upon shadows for our judgment of solidity, size and perspective, the absence of shadows produces a peculiar psychological effect upon those who remain long in such a room, due, perhaps, to an effort of the eye to recognize objects without this long accustomed aid to vision. Most individuals will demand under such conditions much more brilliant illumination than that which they require with direct illumination. If indirect illumination is attempted with incandescent lights, it requires a maximum of expense to produce a comfortable sensation of sufficient illumination. If, as has been done in Germany, the electric arc lamp is used instead of incandescent lamps, it is not so satisfactory, for proper trimming and care of such lamps is necessary to prevent a considerable amount of flickering. This requires an amount of skill which is not generally obtained at the hands of the average janitor of a schoolhouse. A widely extended experience has shown that while indirect illumination may be fairly satisfactory in large halls and lecture rooms, it is, as a rule, a source of great complaint in rooms in which studying, writing, drawing or sloyd is done.

On April 29, 1907, the school committee of the city of Boston appointed a committee, of which I had the honor to be chairman, consisting of three oculists and two electricians, to consider the subject of illuminating school rooms in the city of Boston. This committee[1] rejected, after careful consideration, indirect illumination for the reasons given above. It also did not consider that gas illumination by incandescent mantles was desirable, owing to the heat and products of combustion thrown off into the atmosphere by this method of illumination. They, therefore, determined to make a series of experiments with incandescent electric lamps for the purpose of deciding, if possible, upon some practical and not too expensive method of arriving at a satisfactory illumination of school rooms. They were aided in their labors by the school-house commission, a board which constructs the school houses of Boston. This commission placed at our disposal a room in an abandoned school house. The size of this room was 28x28 feet, and the height was fourteen feet, or slightly higher studded than the standard school room recently adopted in Boston. The walls were painted light yellow and the ceiling white and the room was wired with duplicate circuits, so that one experiment could be tried immediately after another by simply throwing a switch. They also gave us the services of their electrical engineer, Mr. B. B. Hatch, to whose intelligence, skill and ingenuity the success of our experiments was largely due.

---

[1] The members of this committee were: James E. Cole, George S. Derby, M.D., Robert H. Hallowell, F. I. Proctor, M.D., Myles Standish, M.D.

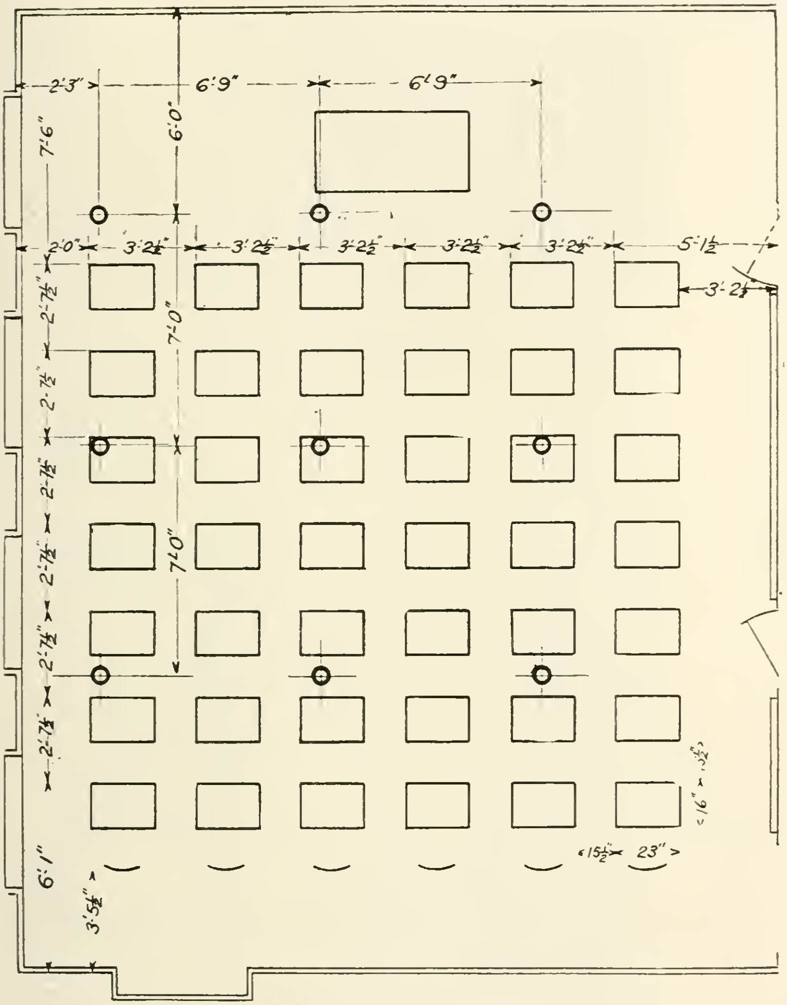
It was found that in most methods of direct illumination it was necessary to have at least nine stations, that it was difficult not to have too great illumination on the desks directly beneath the fixtures and on the other desks too little, to avoid conflicting shadows arising from the multiple sources of light, that often not only would there be several shadows of the pen falling in undesirable positions, but also that several shadows of the head of the pupil would fall upon his work. Experiments were made by arranging all the lights upon the left side of the room and also by making two lines of lights, one at the left side of the room and the other at the center of the room, all placed at an angle with various forms of reflectors. In these experiments it was found that while most of the desks were fairly evenly illuminated by such an arrangement, and while the shadows fell at the right of the work, it was impossible to so place the lamps as not to have the bare filaments within the field of vision most of the time. In fact no arrangement could be made in which the bare lamps were used where this undesirable factor was not present. Having determined that the distribution of lighting stations was desirable and that bare filaments should not be permitted, the question of shades was of next consideration. We found that most of the shades in the market confined the illumination to a comparatively small area directly beneath the fixture, beyond which there was an abrupt fall in the amount of the light, and that it was absolutely desirable to find a shade which would distribute the rays of light as evenly as possible. There are certain shades in the market through which light is transmitted and dispersed widely, but they were found undesirable on account of the facets, which became multiple sources of brilliant illumination. Finally the committee, after consultation with Maj. E. A. Zalinsky, U. S. A., retired, made experiments with the shade invented by him. It was found that this shade was constructed of prismatic glass, coated on the inner or outer surface with white enamel, and that sufficient light passed through it to properly illuminate the ceiling and upper portion of the walls of the room, but that the greater proportion of the light was reflected downward at such an angle that the area of illumination was surprisingly wide. (The shape and dimensions of the shade will be seen from the accompanying drawing, Fig. 1). Within these reflectors were placed incandescent lamps; the lower third or less of the bulb was frosted so that it was impossible for the filament to be seen, yet the greater part of the light passed through the clear portion of the bulb, and was reflected by the prisms downward and outward with great evenness of distribution. Such lights produce shadows which give to the room in general a satisfactory illumination, but the problem arose as to how to arrange the stations so that these shadows should never fall upon the pupil's work. The final arrangement, as worked out by Mr. Hatch, is shown in the accompanying plan, from which it will be seen that the center of light distribution is to the left of the middle of the room when facing the teacher's desk, and slightly nearer the front than the back of the room. The exact position in the standard school rooms in the city of Boston is indicated on the diagram (Fig. 2). With the lamps so placed and ten feet six inches above the floor within a Zalinsky prismatic diffusing reflector it was found that in no case the shadow of pen fell upon the work of the pupil or to his right, that at no desk was the shadow of the head cast upon the work, and that with the proper lamps the candle foot illumination on the top of the desks was approximately 2.5 at every desk, a remarkably even distribution. The supporting fixture (an illustra-



PLAN OF REFLECTOR FOR TUNGSTEN LAMP.

Figure 1.

tion of which is here given, Fig. 3), is simple, consisting merely of a rod and chain from which is suspended the shade and lamp socket. The simplicity reduces the expense of the fixture and the cost of keeping it clean. Indeed, if dust accumulates upon it, it does not materially reduce the illumination upon the desks in the room.



PLAN OF STANDARD SCHOOL-ROOM, SHOWING LOCATION OF LIGHTS.

Figure 2.

Experiments were made with various forms of lamps. The ordinary incandescent lamp was quickly rejected. Experiments were principally made with what is known as the high efficiency or low watt incandescent lamps which have been put upon the market in the last year or two. The most satisfactory results were obtained from 36-candle power 40-watt Tungsten lamps. The Tungsten lamp is similar in appearance to a slightly elongated standard incandescent lamp with the lower portion frosted. The filament is more brittle than the ordinary filament, and as a result the lamp can only be used when hanging in a vertical position. The life of the lamp is about a thousand hours, considerably longer than the ordinary carbon filament, and it gives practically an even light throughout its entire life. Its spectrum is very satisfactory. About the same results were obtained from 100-watt G. E. M. lamps.

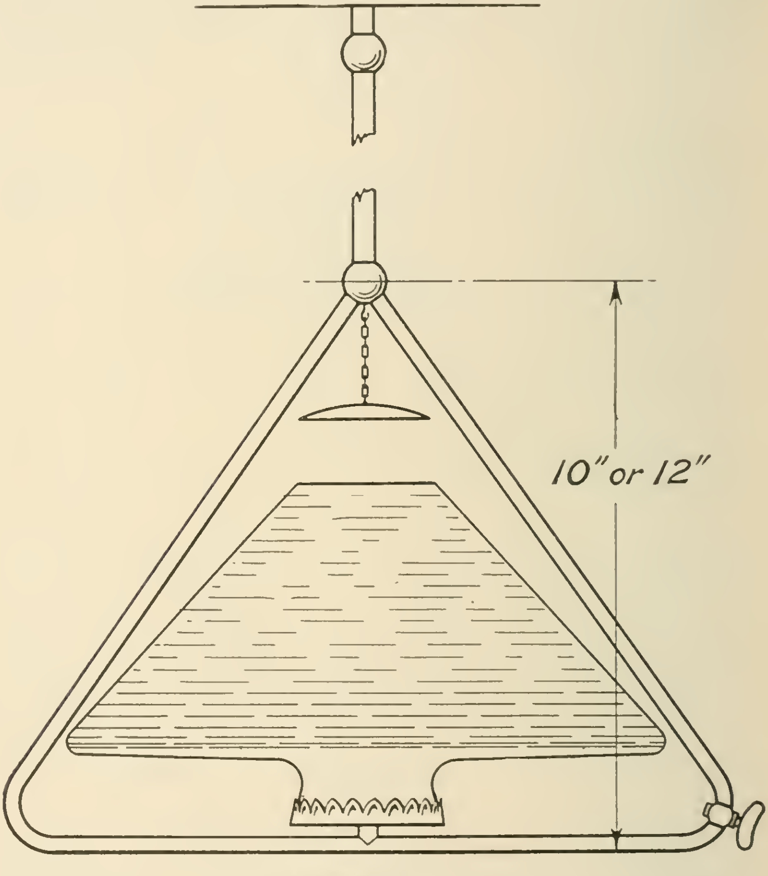


Fig. 3.—Tungsten Lamp.

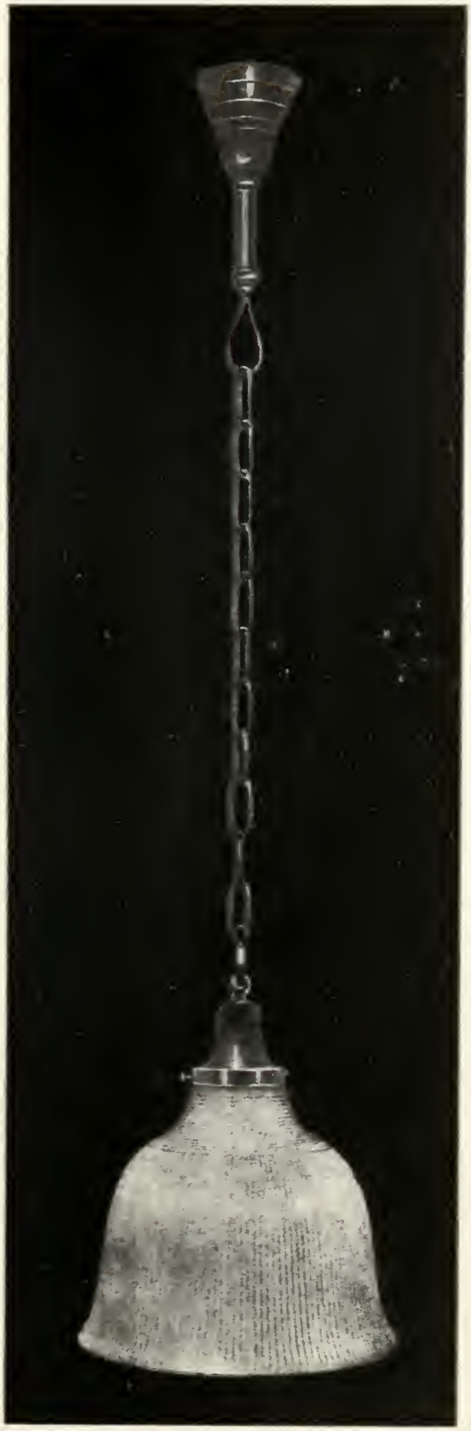


Fig. 4.—Tungsten Lamp: Shade and Supporting Fixture.

The committee found that the comparative current consumption of a school room lighted with nine 40-watt Tungsten lamps, nine 100-watt G. E. M. lamps, and the present standard lighting with indirect clusters as used in the Boston schools, was as follows:

| | |
|---|---|
| 9 Tungsten 40-watt lamps | 360 watts |
| 9 G. E. M. 100-watt lamps | 900 watts |
| 6 indirect clusters (present standard, two 8-candle power and two 16-candle power each) | 960 watts |

As will be seen, the saving in current by the substitution of 9 G. E. M. 100-watt lamps was not great, but the increase in illumination was considerable, as the average candle foot for the present standard, when clean, is about 1.5, whereas the arrangement that has been described above gave 2.5 candle feet at the level of the tops of the desks.

The saving in the substitution of Tungsten lamps is 62.5 per cent. in current consumption, but from this should be deducted the cost of lamp renewals, after which the saving is about 45 per cent. The first cost of wiring a school building which is to be lighted with the Tungsten lamp is smaller than with the standard incandescent lamp, owing to the fact that there is less current and it is carried on considerably smaller wires. The committee of which I have spoken estimated that the saving in the first cost of instillation in a building of twenty-eight class rooms would be approximately $850 less than the expense of the present system. This saving was effected after allowing for the first cost of the Tungsten lamps. The cost of the fixtures above described, including the Tungsten lamp, is approximately $5.00. Since this report was written the price of Tungsten lamps has been reduced nearly 20 per cent., which would make a still greater saving both in the cost of maintenance and installation.

Even with the low cost of current with the Tungsten lamp, it is possible that in some cities the price of gas may be sufficiently low to cause the municipality to use gas in the school room. It would seem to the writer that the only practical method of illuminating school rooms with gas necessitates the use of incandescent mantles, and that the products of combustion given off when in use, especially if the lamps are not well adjusted, is an undesirable factor. Nevertheless, I would like to draw attention to a report of Mr. Bishop Harmon to the educational committee of the London County Council, 1907, giving the results of his researches as to the best method of illuminating school rooms by this means. I was much interested to note that working independently, he had arrived at a very similar distribution of lighting stations to that recommended by the Boston committee, and also that the even distribution of light depended upon the reflecting shades. He found that in most of the shades in use in the London public schools much of the light was dispersed into the upper part of the room, that the bare mantle was often exposed, and that the brass work of the burner cast a black shadow beneath the light. After considerable experimentation, he found efficient reflection could only be obtained from a Welsbach burner when the opal sides of the shade make an angle of about 90°. The spread of the shade is about eleven inches. He says in his report that with a properly devised fixture the lights can be placed where most wanted. . . . "For such a pendant there is the usual ceiling plate, ball and socket joint, and a variable length of tubing to suit the height of the room. The fixture is triangular in shape. One side carries the gas, the other side is merely a support to balance the shade. On the gas side is the stop-cock, which is on the bend and quite clear of the bottom tube. The burner screws onto the bottom without any wasted room filled in with needless brass work." (A drawing of the 90° shade, together with the supporting fixture, taken from his report, is presented herewith, Fig. 4.)

The benefits obtained from this arrangement were that the reflection from the inner side of the shade gave a very wide distribution of light, that the teacher's eyes were screened from the dazzling of the naked mantle by the depth of the shade, and that no shadow could be detected directly beneath the lamp, even when the screen was held but a few inches below the burner.

## SUMMARY.

The essential factors in the proper illumination of school rooms are :

1. The walls should be painted a very light color, preferably an exceedingly pale green or buff.

2. The wooden finish of the room and desks should be light in color.

3. The window shades should be able to exclude direct rays of the sun, diffuse daylight freely, and also in the evening reflect a generous proportion of the light which falls upon them.

4. Direct illumination is desirable.

5. The lighting stations should be so arranged that no annoying shadows shall fall on the pupil's desk.

6. The newer forms of incandescent lamps and Zalinsky shades, when properly arranged, can give a candle foot illumination of 2.5 on each and every desk in the ordinary school room, and finally,

7. That in most cities the expense of electricity, used in the manner above described, is not so much greater than the cost of gas as to be prohibitive.

# THE TREATMENT OF CHRONIC SIMPLE GLAUCOMA.*

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PHILADELPHIA.

(Illustrated.)

The mass of literature concerning the relative value of the miotic and operative treatment of chronic simple glaucoma which has been published during the past decade is enormous, yet the question is still unsettled. Many excellent papers have appeared quite recently, notably those of Bull,[1] Cheney,[2] Risley,[3] and Posey,[4] the first three being in favor of early operative treatment and the last in favor of the miotic treatment.

It seems to the writer that in the consideration of this subject there are a number of points which stand pre-eminently above all others. First, it must be understood definitely what is meant by the term chronic simple glaucoma. I can do no better than to give the reply of Dr. Charles Stedman Bull, when asked what he understood by the term chronic simple glaucoma, in the discussion of his paper read at the meeting of the American Ophthalmological Society in 1907.

Chronic simple glaucoma "represents to me occasional, interrupted loss of accommodation, never complete but partial, varying at different periods of the twenty-four hours (and this opinion is based upon having examined many of these patients very late at night, for my own satisfaction), occasional partial dilatation of the pupil, never complete dilatation, impairment of central vision, concentric narrowing of the field of vision, cupping, more or less marked, of the optic disc of the glaucomatous type, beginning on the temporal side of the disc, an increased tension which at times is entirely absent and therefore requires repeated examinations to make the diagnosis; and when the tension is increased, under the ophthalmoscope, one sees a distinct pulsation, not only of the veins but of the arteries, which can be traced to the periphery." If these symptoms be found in a patient, that patient has what we understand to be chronic simple glaucoma.

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*Read before the Oregon State Medical Society at Portland, Oregon, July 1, 1908.

[1] Trans. Amer. Ophthalmological Society, 1907.

[2] Ophthalmology, April, 1905.

[3] Trans. Section on Ophthalmology, Amer. Med. Assoc., 1907.

[4] Trans. Section on Ophthalmology, Amer. Med. Assoc., 1906.

Given these symptoms, what is the best method of treatment to be pursued? According to some surgeons, the constant employment of the miotics is preferable to any form of operative procedure. Statistics have been given to show that the employment of eserin persistently will maintain the visual acuity as long as if an iridectomy had been performed.

On the other hand, competent authorities have compiled statistics to show that when cases of chronic simple glaucoma were treated by iridectomy the visual acuity was maintained for a longer period than in similar cases that had received the miotic treatment. Again, many cases have been related in which one eye was treated by iridectomy and the fellow eye by the persistent employment of instillations of eserin, the visual acuity being maintained longer in the eye that had undergone operative treatment than in the eye that had received the miotic treatment. After all, therefore, it seems to be a matter of personal experience. If a competent ophthalmic surgeon has treated a number of cases of chronic simple glaucoma by both of these methods, and his results have been better from the use of one than from the use of the other, he is inclined naturally to advise his patients to accept that method with which he has obtained the best results.

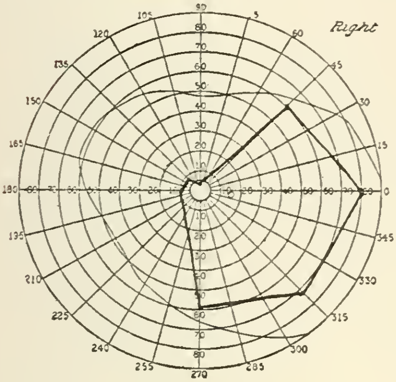
In regard to some of the statistics that have been published, the writer regrets to be obliged to say that in his opinion they are of little value. As Bull himself has pointed out, "statistics of an operation coming from a large institution in which there are a number of operators, are much less valuable to us for drawing conclusions than the cases operated upon by a single man. There are scarcely any two men who do a similar operation in exactly the same way, therefore the statistics gathered from the work of one man, no matter who he is, are better." The personal equation enters so greatly, not only into the question of operative technic in the performance of iridectomy, but also into the question as to the best time for the performance of this operation, that, in the opinion of the writer, a few well-studied cases from the experience of one man, cases in which he himself has made the examinations from time to time, has taken the fields of vision, and has performed the operation, if there has been an operation, are of very much greater value than many times the number of cases selected from hospital work, that have occurred in a number of clinics, or even if selected from one clinic, and the examinations have been made by assistants rather than by the surgeon himself.

My own personal experience in the treatment of this type of glaucoma is certainly in favor of the performance of iridectomy. With sclerotomy I have had very little experience and can not give any opinion of value concerning it. Formerly, it was my custom to advise early operation in all cases of chronic simple glaucoma that consulted me. Of late years, however, it has seemed to me better to employ, as it were, a combination of the miotic and operative treatment. When I am first consulted by a patient affected with chronic simple glaucoma, if the disease be not far advanced, the field of vision not markedly contracted, the central visual acuity good, and there are no scotomata, it seems to me better to employ weak solutions of eserin, gradually increasing the strength from time to time as the effect upon the eyeball diminishes. If the patient has not been accustomed to the employment of this drug, a solution of the strength 1/12 gr. to 1 oz. is recommended, and a drop or two should be instilled into the eye every three hours. At bedtime a solution twice the strength of that employed during the day should be instilled so as to overcome the tendency of the pupil to dilatation during the period of sleep. As previously stated, the strength must be greatly increased from time to time, a solution sufficiently strong being employed to keep the pupil permanently contracted, almost to a pin point. If pilocarpin is employed, double the strength of the eserin solutions must be used.

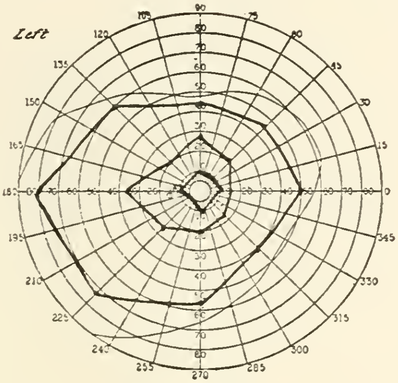
The number of hours that the eye should be employed for near work must be restricted and minute directions should be given the patient concerning the proper illumination. Any existing refractive error should be corrected and the patient's glasses changed as frequently as found necessary. The elimination of any gouty or rheumatic diatheses, a moderate amount of exercise in the open air, the employment of nitroglycerin and strychnia, not only because of their effect upon the circulation but also because of their influence on the optic nerve, in fact, everything that will tend to increase the vitality of the patient, must be recommended.

If, notwithstanding the employment of the miotic treatment, together with the various adjuvants as described above, the field of vision continues to contract, central vision becomes more or less impaired and scotomata begin to appear in the field, it becomes necessary to do something more, an operative procedure is advised. So long as the miotic treatment continues to hold the affection in check, it has seemed wiser to the writer to continue its use, but when the disease makes marked progress in spite of its employment, iridectomy should be recommended at once.

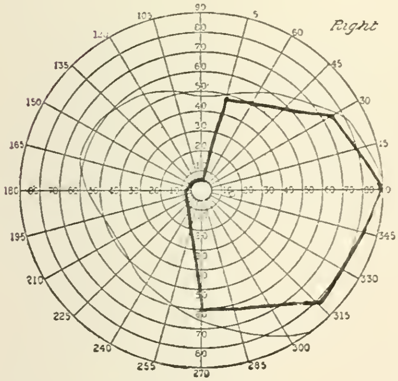
The question of age, as pointed out by Cheney, should also be taken into consideration in determining whether or not operative procedure should be resorted to. If the patient is very old and has in all probability only a few years in which to live, and it is likely that useful vision may be maintained during life, or if the patient is not in good physical condition to recover from an operation, it is advisable not to recommend operative procedure. Also, if one eye is blind and the disease is present in the fellow eye, it seems advisable to avoid operative procedure in an elderly patient, if possible. It must be borne in mind that neither the operative nor the miotic treatment will cure chronic simple glaucoma. They are only employed with the idea of holding the disease in check as long



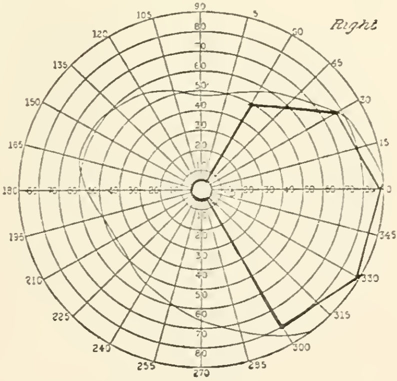
CASE I. FIG. 1.
Obj. 1 cm. sq. 4, 3, '98.



CASE I. FIG. 2.
Fields for white, red and green. Obj. 1 cm. sq. 4, 3, '98.



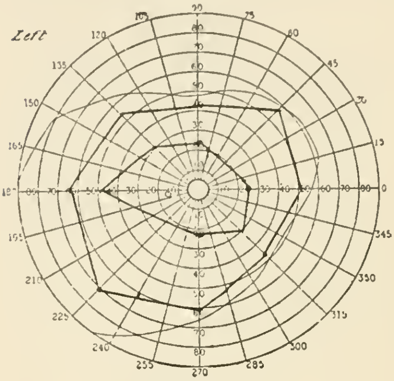
CASE I. FIG. 3.
Obj. 1 cm. sq. 5, 23, '98.



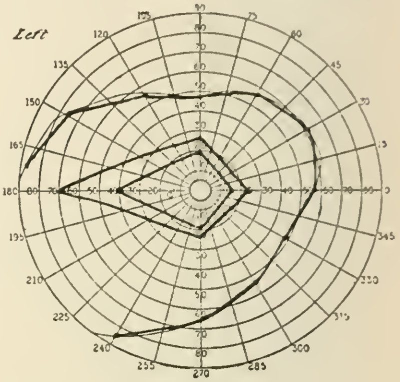
CASE I. FIG. 4.
Obj. ½ cm. sq. 1, 27, '00.

as possible. No rules which must not be deviated from can be given as to the choice of treatment. Each surgeon with any degree of experience will naturally find himself following the line of least resistance, and recommending the method of treatment with which he has obtained the best results.

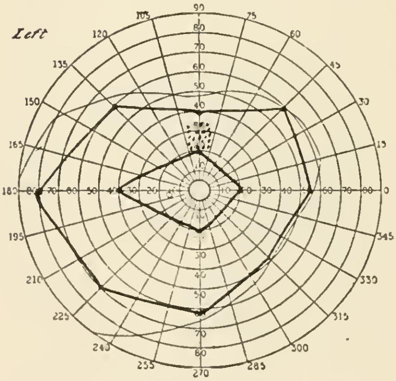
In the performance of iridectomy, it is my custom as with many other operators, to enter the point of a keratome sufficiently posterior to the corneo-scleral junction to have it enter the anterior chamber just in front of the periphery of the iris. In most eyes this point will be 1.5 to 2 mm. posterior to the corneo-scleral junction. A large portion of the iris is then excised, usually about one-fifth of its circumference. If the anterior chamber is exceedingly shallow so that the transparency of the lens is jeopardized by



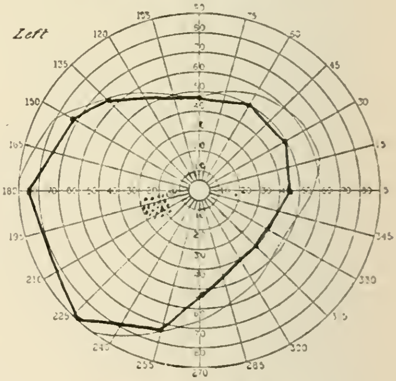
CASE I. FIG. 5.
Fields for white and red. Obj. ½ cm. sq. 1, 27, '00.



CASE I. FIG. 6.
Fields for white, rend and green. Obj. ½ cm. sq. 6, 18, '00.



CASE I. FIG. 7.
Field for white and green. In the scotoma white appears gray. Obj. ½ cm. sq. 11, 12, '01.

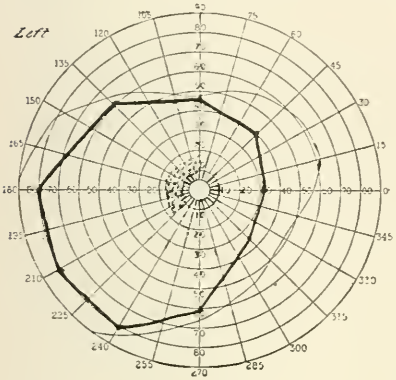


CASE I. FIG. 8.
Scotoma for red and green. White is grayish. Obj. 1 cm. sq. 10, 28, '01.

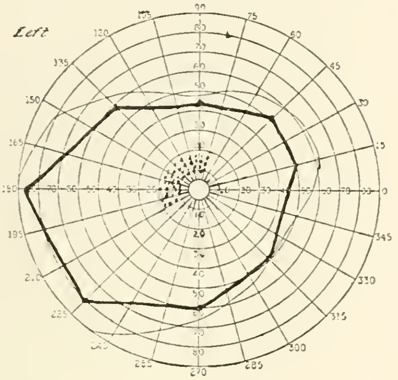
the employment of a keratome, a narrow Graefe cataract knife is employed in making the corneal section.

As illustrative of some of the results obtained both by the operative and non-operative methods of treatment, the notes of the following cases are appended.

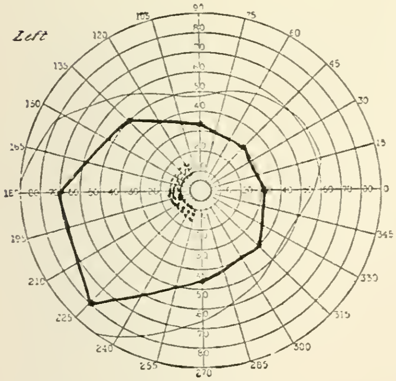
CASE 1.—R. B., aged 60 years at the time of first examination, April 3, 1898, consulted me for an examination for glasses. Two years before he had suddenly discovered upon closing the left eye, that the vision of the right was much reduced. Vision of O.D. was 5/c, of O.S. 5 xxii pt. Ophthalmoscopic examination of the eyes showed in the right a typical glaucomatous cup, vessels being crowded to the nasal side, the cup exceedingly deep, and the disc surrounded by a glaucomatous ring. The veins were pulsating, but the arteries did not differ from normal. The field of vision was



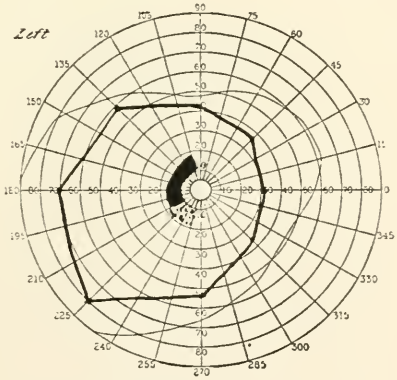
CASE 1. FIG. 9.
Scotoma for red and green. White is grayish. Obj. ½ cm. sq. 12, 2, '01.



CASE I. FIG. 10
Scotoma for red and green. White is grayish. Obj. 1 cm. sq. 7, 29, '03.

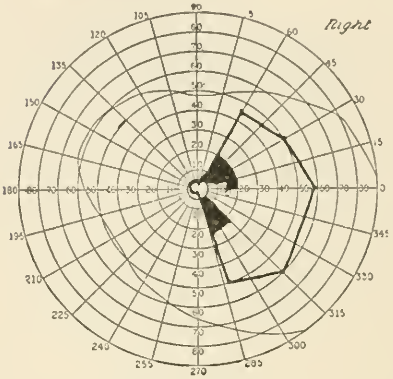


CASE I. FIG. 11.
Relative scotoma. Obj. 1 cm. sq. 9, 19, '04.

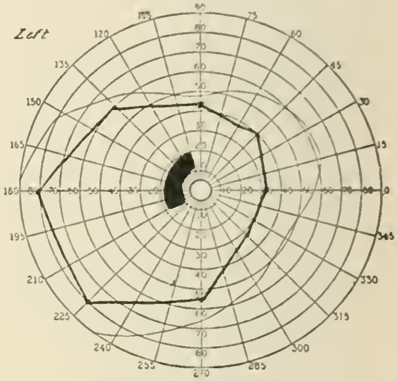


CASE I. FIG. 12.
Absolute and relative scotoma. Obj. 1 cm. sq. 10, 14, '04.

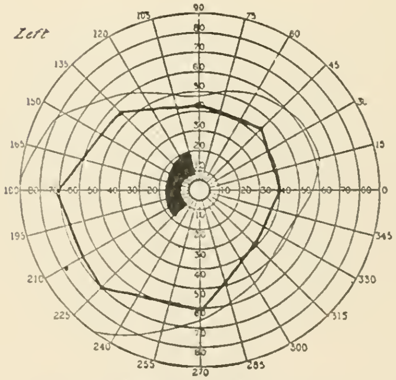
contracted to within a few degrees of the fixation point as shown in Fig. 1. The left eye showed a shallow cupping of the optic disc, probably the beginning of a glaucomatous excavation, the field being slightly contracted (Fig. 2). In the right eye with + S. 1.75 D., vision equaled 5/vii ss; with + S. 2.00 D. vision equaled 5/iv in the left. The field of vision in the right eye was contracted so closely to the fixation point that, although central vision was exceedingly acute, only a portion of a long word could be seen at one time.



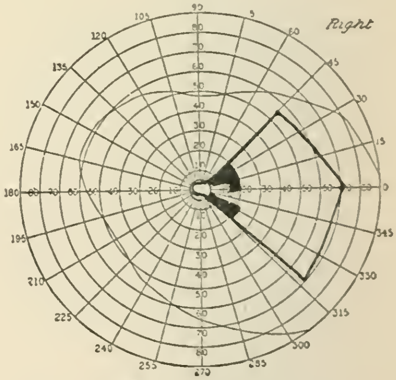
CASE I. FIG. 13.
Absolute scotoma. Obj. 1 cm. sq. 10, 14, '04.



CASE I. FIG. 14.
Absolute scotoma. Obj. 1 cm. sq. 11, 24, '04.



CASE I. FIG. 15.
Absolute scotoma. Obj. 1 cm. sq. 7. 20, '06.

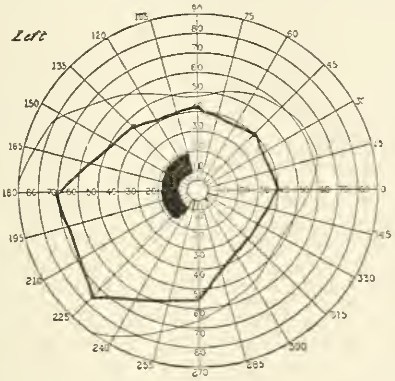


CASE I. FIG. 16.
Absolute scotoma. Obj. 1 cm. sq. 7, 20, '06.

The conditions were explained to the patient, a most intelligent man, and on April 9, 1898, a broad peripheral iridectomy was performed on the right eye. There was extensive hemorrhage when the iris was cut, but no other complication. The eye healed readily and on May 23, 1898, with a + cyl. 3.00 D. lens, axis 15°, vision equaled 5/vii ss, and with a reading glass the patient could read Jaeger 1. The field of vision is at this time as shown in Fig. 3.

The patient was then given a solution of eserin to use, which was occasionally changed to pilocarpin, but one of these two drugs was employed constantly. In addition, at various times strychnia and nitroglycerin were administered.

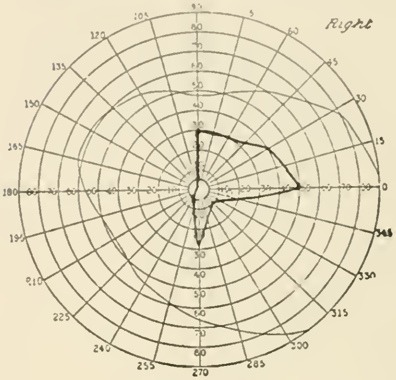
The patient, although living in a distant city, presented himself for examination several times each year, but notwithstanding the constant and faithful employment of the miotic treatment, the unoperated eye gradually became worse. Thus the field of vision (of O.D.) Jan. 27, 1900, is that shown in Fig. 4, and on the same date the field of the left eye is shown in Fig. 5. It will thus be seen that the right, or operated eye, was holding its own, while the left was losing. On this date the tension of the left eye seemed to be slightly increased. On June 18, 1900, the field of O.S. is again shown (Fig. 6), that for form now being normal, vision for red and green being contracted. On Nov. 12, 1900, as observed in Fig. 7, the field of the left eye is again contracted and there is present a scotoma. Central vision still remained good, but the glaucomatous cup was increasing in size. Iridectomy was now suggested, but declined. The fields of Oct. 28, 1901, Dec. 2, 1901, April 29, 1903, Sept. 19, 1904, and Oct. 14, 1904, are shown in the accompanying diagrams (Figs. 8, 9, 10, 11, 12). Iridectomy was repeatedly advised, but always declined. The field of the right eye had decreased but slightly since the condition at the time of operation several years before, as seen in Fig. 13, central vision in this eye now being 6/ix—. On Oct. 14, 1904, vision of the right eye equaled 6/xii+; that of the left eye equaled 6/ix—. The anterior chamber of the left eye was shallow, the pupil very small. No tension could be detected. Iridectomy was once more advised, accepted, and performed on the following day, Oct. 15, 1904, with no complication excepting extensive hemorrhage at the time of cutting the iris. There was no complication in healing and, as may be seen from the field taken Nov. 21, 1904 (Fig. 14), there was



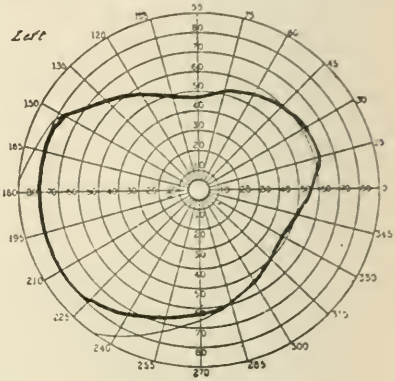
CASE I. FIG. 17.
Absolute scotoma. Obj. 1 cm. sq.
7, 12, '07.

somewhat less contraction and the scotoma was somewhat smaller than at the time the iridectomy was performed. On July 20, 1906, the fields of both eyes are shown (Figs. 15 and 16), and on July 12, 1907, the field of the left is shown (Fig. 17). On the latter date central vision for O.D. was 6/xii and for O.S. 6/xii.

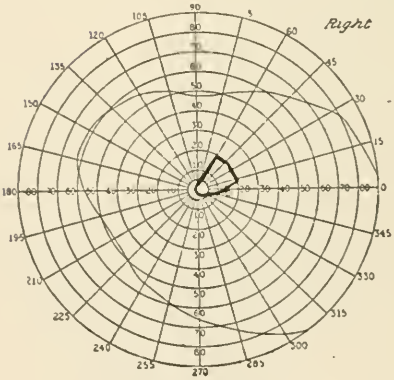
Case 2.—C. N.,[5] an electrician, aged nineteen years, a former pupil at Girard College, presented himself at the eye dispensary of the Jefferson Hospital July 12, 1902, complaining of gradually failing vision, first observed three years before, when in his sixteenth year of age. During this period he had received three months' treatment at another hospital and at the time of the examination was wearing concave lenses prescribed by an optician. The vision of the right eye, without glasses, equaled 6/cc: of the left, 15/c. With the following correction, O.D. — S. 7.00 D. $\bigcirc$ — cyl. 1.25 D. axis 150°, and O.S. — S. 3.50 D. $\bigcirc$ — cyl. 1.00 D. axis 135°, vision was improved to 20/xx and 20/xl respectively. The ocular



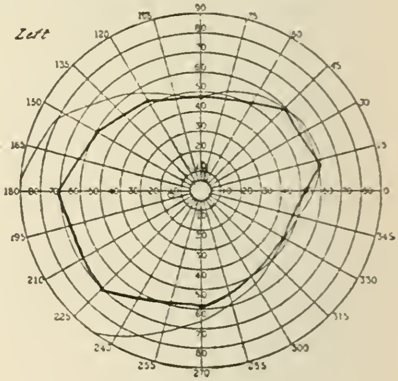
CASE II. FIG. 1.
Obj. 1 cm. sq. 7, 15, '02.



CASE II. FIG. 2.
Obj. 1 cm. sq. 7, 15, '02.



CASE II. FIG. 3.
Obj. 1 cm. sq. 5, 27, '03.



CASE II. FIG. 4.
Obj. 1 cm. sq. 5, 27, '03.

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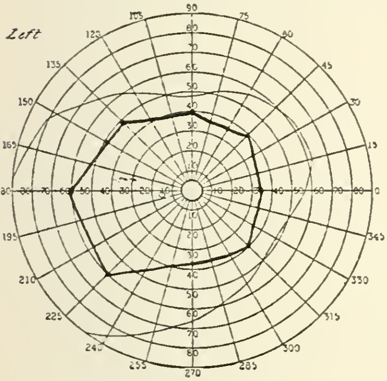
[5] Case reported in Ophthalmic Record, January, 1904.

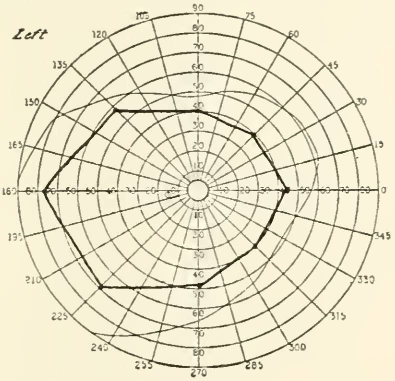
conjunctivæ were very slightly injected. The right pupil reacted somewhat sluggishly, and the left promptly. Tension was very slightly increased in each eye.

There was a distinct family history of myopia. Regarding the grandparents' eyes no history was obtainable. The parents used glasses in late life for near work only and were therefore probably not myopic. Of nine children, five boys and four girls, only two are not myopic, one boy and one girl. In one sister the myopia has progressed so far as to produce intraocular changes, including cataract in one eye, an unsuccessful attempt to remove the latter several years ago having been followed by blindness. In none of the children, however, excepting the patient, have any glaucomatous symptoms been observed.

Ophthalmoscopic examination of the right eye showed a typical glaucomatous excavation of the optic disc surrounded by the usual ring of atrophic chorioid. The vessels disappeared suddenly over the disc margin and were crowded toward the nasal edge. The bottom of the cup was best observed with a — S. 16.00 D. lens.



CASE II. FIG. 5.
Before iridectomy. Obj. 1 cm. sq.
7, 8, '03.



CASE II. FIG. 6.
After iridectomy. Obj. 1 cm. sq.
10, 6, '03.

Ophthalmoscopic examination of the left eye revealed an oval disc with a large physiological cup. The refraction was myopic. The visual fields taken three days later show that of the right eye to be almost lost (Fig. 1), there remaining only a small upper temporal portion, which, however, included the fixation point. The left field (Fig. 2) was very slightly contracted concentrically.

The patient was given a solution of eserin for local use and strychnia for internal use, but after a few days' treatment passed from observation and was not seen again until May 27, 1903, ten months later. At this time the vision of the right eye was reduced to light perception in a very small field (Fig. 3) and that of the left eye equaled, with glasses, 20/l, the field (Fig. 4) being somewhat more contracted than at the previous examination. The excavation of the right optic disc had increased in extent and that of the left, which had been deemed previously to be physiological, was now distinctly pathological, much larger in size, extending to the disc margin, the vessels dipping suddenly over its edge and being crowded toward the nasal side. Congestion of the ocular conjunctiva was slightly more marked and tension was + 1 in each eye. The myopia of the left eye had also increased from 3.50 D. to 9.00 D.

For six weeks internal and local treatment were employed faithfully, in spite of which the condition became gradually worse, the tension increased, and a ciliary staphyloma began to form in each eye. On July 9, 1903, a broad peripheral iridectomy was performed on each eye without complication. The tension was immediately reduced and the visual field of the left eye became slightly larger (Figs. 5 and 6), and this condition has been maintained. The visual acuity with the correcting lens — S. 9.00 D. ≍ — cyl. 1.00 D. axis 90°, equals 6/xv and Jaeger 1 is easily read. This condition was maintained up to the time of the last examination, which was made in the latter part of 1906, since which time the patient has passed from observation.

Case 3.—A. B.,[6] an unmarried colored woman, was first seen April, 1898. No family history of any ocular disease could be elicited. A grandmother, aged 83, and a great aunt, aged 91, were still living and possessed good vision. At 16 years of age the patient had typhoid fever, during which there was an indefinite history of a mild attack of inflammation in both eyes. The patient is positive, however, that the vision of the right eye begain to fail during convalescence from the attack of fever. There were at no time any inflammatory symptoms or pain. The vision gradually diminished until it was finally entirely lost when she was 19 years of age, or about three years from the beginning of the disease. From this time on there were occasional attacks of severe pain becoming more and more frequent and located by her in the eyeball, temporal region, and along the side of the head, and it was for relief from this condition that she sought advice.

Examination showed a divergent strabismus of 45° in the right eye, no inflammatory symptoms, and a typical complete glaucomatous cup, the bottom being best observed with — S. 9.00 D., the macular region appearing practically emmetropic.

Ophthalmoscopic examination of the left eye showed a normal disc of healthy appearance with a small physiological cup and pulsating veins. The tension and field were normal.

The refractive error of the left eye was carefully corrected, and after a year's treatment of the glaucomatous eye with miotics locally and sodium salicylate, bromids and the various analgesics internally, the eye was enucleated. The sections showed a very deep kettle-shaped excavation of the nerve, the lens was unusually large, the epithelial cells markedly pigmented at and beyond the corneal limbus, and there was also found considerable pigmentation between the bundles of the ciliary muscle and around the loose meshed tissue between the canal of Schlemm and the angle of the anterior chamber.

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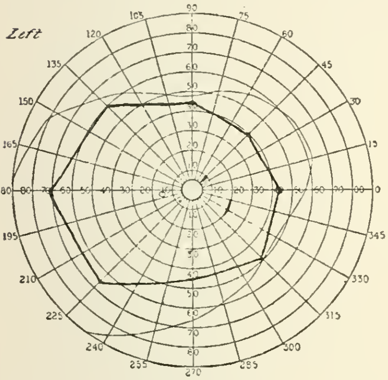
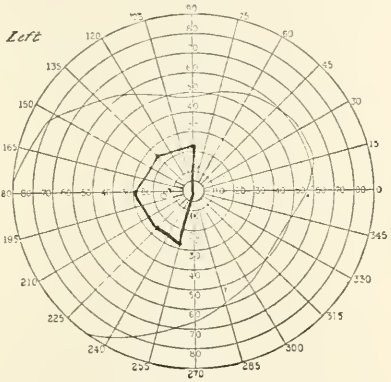
[6] Published in Ophthalmic Record, January, 1904.

Here was a case, therefore, in which chronic simple glaucoma began in the sixteenth year of age and which rapidly progressed to total blindness in the nineteenth year, with no appearance of glaucoma in the other eye thirteen and a half years later.

Ten months ago, three and a half years after reporting the case and seventeen years from the appearance of glaucoma in the first eye, the patient came to see me, complaining of dim vision in the remaining eye, which, she stated, had been observed first three months before. Ophthalmoscopic examination showed a beginning glaucomatous cup, the vessels being crowded to one side and the visual field being considerably contracted (Fig. 1). The tension was slightly elevated. Miotics were faithfully employed locally and strychnia and nitroglycerin internally, but in spite of this the cup of the optic nerve became more and more extensive and the field of vision more and more contracted. When it was found after some weeks that the miotics in gradually increasing strengths did not seem to check the advance of the glaucoma, iridectomy was proposed and respectfully declined. Ten months have now elapsed, the patient having always declined operative procedure whenever such was proposed, and although the miotic treatment, together with optic nerve stimulants, have been carefully and faithfully employed, the patient is now almost blind, there remaining but a small amount of eccentric vision and the field being contracted to a very limited area (Fig. 2). Three months later there still remained a small area of vision in the temporal field.



CASE III. FIG. 1.
Obj. 1 cm. sq. 3, 5, '07.

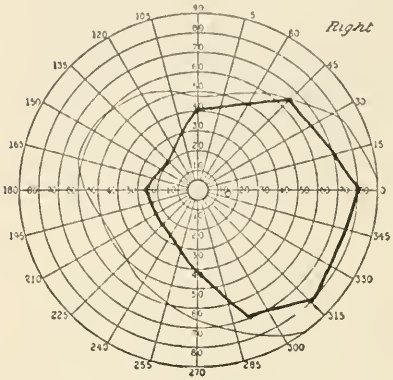


CASE III. FIG. 2.
Obj. 2 cm. sq. 10, 17, 07.

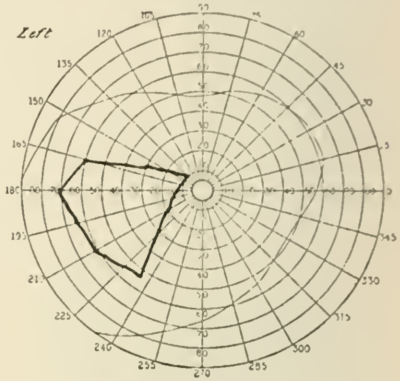
Case 4.—G. G., a male, aged 65 years, presented himself for an examination for glasses. Ophthalmoscopic examination revealed typical chronic simple glaucoma in each eye, but little vision being preserved in the left. He had never had any treatment for his condition, thinking that the failure of vision was simply due to his advancing age. Central vision of the right eye equaled 5/xxvii;

of the left, 3/clx. The field of the right eye is seen in Figure 1, and of the left in Figure 2. Extensive cupping of the disc was present in each eye, more marked in the left. Increased tension could not be detected in the right eye, but the tension of the left equaled + 1.

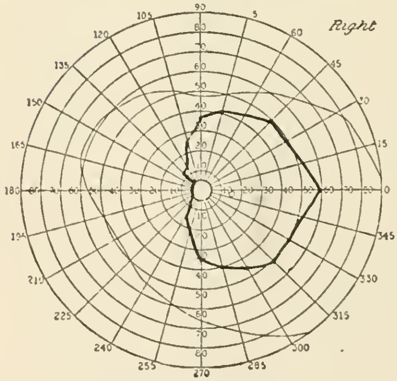
Solutions of eserin alternated with pilocarpin were employed constantly, and from time to time strychnia and nitroglycerin were also administered. Two years later the field of the right eye, as



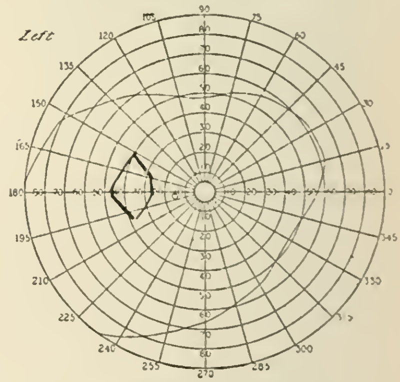
CASE IV. FIG. 1.
Obj. 1 cm. sq. 5, 28, '95.



CASE IV. FIG. 2.
Obj. 2 cm. sq. 5, 28, '95.



CASE IV. FIG. 3.
Obj. 1 cm. sq. 3, 3, '97.



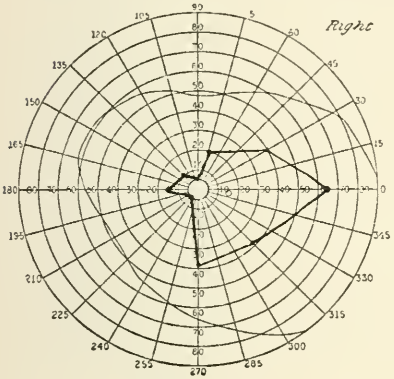
CASE IV. FIG. 4.
Obj. 2 cm. sq. 3, 3, '97.

shown in Figure 3, was contracted to within a few degrees of the fixation point; the field of the left eye (Fig. 4) now being a very small area in the temporal half. An iridectomy was performed on the left, or practically blind eye, in order, as Schweigger suggested, to test its "temper," so as to ascertain whether it would be advisable to operate on the right, or better eye (which did not seem to be the case, as the field was greatly contracted), but the eye did not do well and therefore the idea of operative procedure upon the right was abandoned. The patient continued to employ the miotic treatment.

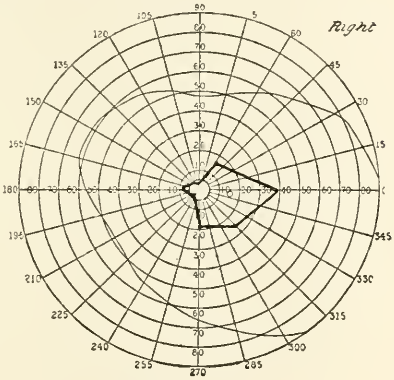
but became blind two years later, or four years from the time he was first seen.

It is not definitely known in this case, as is true of most cases of chronic simple glaucoma, just how long the disease had existed, but the patient was under observation for four years prior to the time he became blind, and stated that his vision had been failing for four years before he had sought advice. Whether the glaucoma had its inception at the beginning of this failure of vision and continued for a period of eight years, or whether during the early part of this period the failure of vision was simply due to the patient's age, could not be determined. The failure of vision, however, did not begin in both eyes at once.

Case 5.—F. L., widow, aged 74 years, was first examined by me about three years ago. She had first observed failing vision in the left eye six years before consulting me and had been blind for one year. The vision of the right eye had been failing for two years.



CASE V. FIG. 1.
Obj. 1 cm. sq. 6, 6, '05.



CASE V. FIG. 2.
Obj. 1 cm. sq. 1, 7, '08.

There had never been any inflammatory symptoms, the patient complaining only of her poor vision, and ophthalmoscopic examination showed typical glaucomatous cups in each eye, more marked in the left. The field of vision of the right eye is shown in Figure 1.

This patient had been under the care of one of my former assistants for more than a year, who had been treating her with miotics and optic nerve stimulants, but the vision had gradually failed. To my personal knowledge she has now been employing eserin and pilocarpin solution from four to six times a day regularly for the past three years, and maintains a small amount of central vision, viz., 6/lx, and the present field is indicated in Figure 2.

A study of the first case, covering as it does a period of more than ten years, is very instructive. When first examined in 1898, the condition of the right eye was such that, under ordinary circumstances, but very little hope could be entertained of retaining the central vision by operative procedure. When the field of vision is contracted to a point in the immediate neighborhood of the fixation point, so far as retaining central vision is concerned, operative procedure is, as a rule, inadvisable. On the other hand, with conditions as they existed in both eyes of this patient, viz., chronic simple glaucoma advanced to a late stage in the right eye and beginning in the left, in the opinion of the writer it is better to operate upon the poorer eye so that some idea may be obtained as to what may be expected from operation upon the better eye. In the present instance, although the field of vision was contracted to within a few degrees of fixation point and central vision equaled only 5/vii ss at the time of operation, to-day, ten years later, there is still a good visual field compared with that present at the time of operation, and central vision equals 6/xii.

Two years after the first examination and operation upon the right eye, notwithstanding persistent miotic treatment, the field of vision of the left began to contract, but the central vision remained good and there were no scotomata. A half year later the field was still contracted and scotomata had commenced to form. Operation was advised, but declined. The eye gradually became worse, the disease slowly advancing in spite of persistent and careful miotic treatment, but operation was always declined until Oct. 15, 1904, six and a half years from the time of first coming under observation. Central vision now equaled 6/ix—, the field was considerably contracted and scotomata were present. Operation was performed and, though nearly four years have elapsed, the condition present at the time of the operation has been maintained.

The second case also forcibly illustrates the fact that in many cases the miotic treatment will not check the progress of the disease when peripherally placed iridectomies will do so. The conditions present in this case at the time of operation were maintained up to the time of the last examination more than three years after the operation had been performed.

The third case shows the affection progressing rapidly to the condition of absolute glaucoma, notwithstanding the employment of the miotic treatment. The possible result of operative treatment can only be speculated upon here, as the patient always declined it whenever proposed.

The fourth case illustrates the advisability of operating upon the poorer eye first in order to ascertain the probable effect of operative treatment upon the other eye, if necessary.

The fifth case is illustrative of that stage of the affection in which it is more advisable to continue the miotic treatment than to adopt operative procedure. With blindness in one eye and the disease so far advanced that the field is very greatly contracted, and especially when it is contracted to within the immediate neighborhood of the fixation point, it is better not to operate, as these cases do not do so well after iridectomy as they do from the constant employment of miotics. In fact, operative procedure under these circumstances, as a rule, only hastens the progress of the disease.

# GLAUCOMA FOLLOWING SECONDARY CATARACT (CAPSULAR) OPERATION,

## WITH A REPORT OF THREE CASES.*

FREDERICK E. CHENEY, M.D.

BOSTON.

It is safe to assume, I think, that glaucoma following a secondary cataract operation is usually, if not always, the direct result of injury to the vitreous body. It is doubtful if even a predisposition to the disease exists in the majority of these patients, for certainly many of them make a rapid and permanent recovery without iridectomy. It is probable that the principal factor in the glaucomatous attack, in the larger proportion of cases, is an obstruction of the filtration angle by vitreous which had come forward into the anterior chamber and to a greater or less degree replaced the aqueous. It is certainly found in this situation in most of the eyes operated on as stated by Dr. Hermann Knapp, in speaking of iridectomy in this disease (Norris and Oliver, vol. iii, p. 786). At times, however, when the vitreous puncture is at some distance from the pupil and the aqueous chamber not evacuated, it may be that the vitreous does not come in front of the iris, but interferes with the lymph excretion by pressing a portion of the iris forward and thus obliterating temporarily the filtration angle over a certain segment of its circumference. This form of glaucoma is not common, occurring according to the author just mentioned in about 1 per cent. of the secondary cataract operations. My personal experience in the treatment of this condition is limited to three cases.

CASE 1.—A male, 48 years of age. Primary operation a simple extraction, left eye, in 1899. Secondary operation one year later, July 24, 1900. The notes are not as complete as could be desired, but two days later the eye was white and quiet and the vision equaled 20/lx+. Six days after the operation the eye became painful, there was headache and nausea and the vision failed rapidly. The tension was found to be increased, there was moderate injection, the pupil was dilated, the chamber of good depth and the cornea slightly hazy. A 1 per cent. pilocarpin solution was ordered every three hours, but, as there was no improvement at the end of the day, this was changed to eserin 0.5 per cent. every two hours, and he was also given leeches to the temple, hot fomentations and a saline cathartic. The next morning the pupil was contracted and the tension normal. He was discharged August 6, with a vision of 20/xxx, which later improved to 20/xv—. He was seen at my office about four years after this attack when the vision was found to be unchanged and there was no history or indication of a recurrence of the glaucomatous condition.

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*Read before the New England Ophthalmological Society, March 10, 1908.

Case 2.—A male, 68 years of age, entered the infirmary April 7, 1904, and the primary operation, a simple extraction, was performed on the following day, April 27, the eye being perfectly white and quiet. I did a secondary operation, dividing a thick capsular membrane in the pupillary area from above downward. There was little or no reaction and six days later, at the time of his discharge, the eye was free from injection and the vision = 20/l+. There is nothing in the records of this case to indicate an injury of the vitreous body or an evacuation of the anterior chamber. There can be little doubt from the subsequent history, however, that the vitreous was punctured by the knife-needle. The patient was not again seen until May 31, when he reported that two days previously he had had severe pain in the eye, accompanied by nausea and failing vision, which continued throughout the day. Upon examination the eye was found to be injected, the pupil moderately dilated, the cornea slightly hazy and anesthetic, the tension increased and the vision reduced to 20/lxx. Pilocarpin, 1 per cent., was used every two hours and hot fomentations 4 t.d. June 6, six days after entrance, the glaucomatous symptoms having entirely disappeared, treatment was discontinued and he was discharged three days later with a vision of 20/l. He reported again July 5, twenty-six days after his discharge from the infirmary, and gave the following history: Ten days ago the eye became a little red and irritable, but felt all right at the end of three days. A week later it again became red and was very painful during the night. The sight failed rapidly and to-day there has been nausea and vomiting. The eye was found to be greatly injected, the cornea hazy and anesthetic, the chamber a little narrowed, the pupil oval and inactive, the tension increased and the vision reduced to fingers at eight inches. The treatment prescribed was pilocarpin, 1 per cent., every hour, frequent hot fomentations and leeches to the temples. On the following day the pupil was contracted, the tension normal, the pain had subsided, the cornea cleared and the injection was less marked. July 8, three days after entrance, as a precautionary measure against future attacks, an iridectomy seemed advisable, and on the following day under cocain a narrow Graefe knife was introduced just back of the limbus, and, on completing the cut, vitreous presented. The iris folded backward so that it was impossible to grasp it with the forceps and the attempt was given up. A spatula was then introduced into the anterior chamber and passed from side to side, the idea being to disintegrate, so far as possible, the vitreous remaining in this situation. Pilocarpin was instilled and the eye bandaged. Nine days later the patient was discharged well, with a vision of 20/lx. January 4, 1908, three and one-half years later, he reported that he had had no pain, redness or other trouble with the eye since leaving the infirmary. The tension was perfectly normal, there was no contraction of the field, no cupping of the disc, or other fundus change, and vision = 20/lx+.

CASE 3.—A female, 48 years of age. Graefe extraction of a mature cataract, March 5, 1906. She was discharged from the hospital fifteen days later. There were no anterior or posterior synechiæ, but considerable dense, opaque capsule in the pupillary area. April 15, 1906, a secondary operation was performed with Knapp's knife-needle. The membrane offered little resistance and a good-sized opening was made centrally. The anterior chamber evacuated completely when the needle was withdrawn, but had entirely refilled within thirty seconds, and the iris had returned to its normal plane. The eye became very painful three hours later and when examined at 4:30 p. m. the pupil was widely dilated, chamber deep, conjunctiva edematous and injected, tension greatly increased, cornea hazy, and vision reduced to fingers. Pilocarpin, 2 per cent., was ordered every fifteen minutes during the day and every half hour during the night; also hot fomentations, and a saline cathartic. On the following day the pupil was well contracted and the tension nearly normal. Two days later the cornea was perfectly clear, the eye but slightly injected, tension normal and vision improved. Pilocarpin was continued three times a day for a number of days and the patient recovered with a vision of 20/xx. There has been no recurrence of the glaucomatous symptoms up to the present time.

In connection with this subject it will be interesting to consider briefly the relation of the vitreous body to the capsular membrane after the extraction of a primary cataract. In the normal eye, as we know, the posterior surface of the lens rests in direct contact with the vitreous, excepting over the small area occupied by the anterior end of the lymph canal which extends from this point backward to the optic disc. With the division of the anterior capsule and escape of the opaque lens, the posterior capsule, which is now the dividing partition between the aqueous and vitreous chambers, is pressed forward by the vitreous body, so that it rests in contact with the posterior surface of the iris. This very anterior position of the vitreous body is fully appreciated by operators who have learned by experience that it is usually advisable to keep out of the anterior chamber after the escape of the lens. With the re-establishment of the anterior chamber the posterior capsule is forced backward by the accumulating aqueous, not to its former position, which would mean a saucer-like depression for its anterior surface, but to a more anterior situation, forming a vertical plane behind the iris and pupil. This posterior capsule may be regarded as the basal membrane in the formation of the secondary cataract. The distance of the vitreous body from this capsular membrane probably varies considerably in different eyes and the depth of the new-formed lymph space which separates these two structures is the important factor in determining our liability to injure the vitreous body in the performance of a capsulotomy. That is, the nearer the anterior surface of the vitreous to the posterior surface of the capsular membrane, the greater the danger of its being punctured. That the anterior portion of the vitreous may become fluid with advancing years and thus lessen this danger is indicated by the frequency with which we see fine floating opacities just behind the lens in elderly people. Bowman's view that the vitreous humor "is more often fluid in the axial region behind the pupil and more consistent near the ciliary region" is undoubtedly the correct one (Wm. Bowman, F.R.S., Ophthalmic Hospital Report, vol. iv.).

A puncture of the vitreous body is not of necessity a serious injury and glaucoma is only an exceptional result. If the anterior chamber is not evacuated vitreous may present itself in the capsular opening, perhaps even projecting somewhat into the anterior chamber, but the counter pressure of the aqueous will naturally prevent a sudden filling of this space. Neither can it be said that glaucoma results in every case even when the anterior chamber is evacuated and becomes refilled with vitreous. It is reasonable to suppose that the density of the vitreous is a factor in determining the outcome in such cases. A normal vitreous being more of an obstruction in blocking the filtration angle than a vitreous that has become partially degenerated and that will more speedily liquefy. In my third case, the wounding of the vitreous body, the complete evacuation of the anterior chamber and its immediate refilling with vitreous that was probably of normal density, as the patient was but 48 years of age, was an ideal combination of circumstances, for the rapid development of a glaucoma and its severe onset three hours later certainly met all the requirements of the situation.

The second case reported is unusual, it seems to me, from the fact that glaucoma did not develop until a month after the discission. and that a second attack came on at the end of another month. If it were not for the presence of vitreous in the anterior chamber at the time an iridectomy was attempted, after the subsidence of the scond attack, one might hesitate to class it as a glaucoma secondary to a puncture of the vitreous body. It hardly seems possible that a segment of vitreous could have remained in the aqueous chamber for two months and not have become liquefied. A possible explanation is the following: In the first place an immediate glaucoma did not result for the probable reason that the anterior chamber did not evacuate and become suddenly filled with vitreous. In the second, the vitreous body did not heal, if the term may be used in this connection, after its injury, but remained an open wound, and preceding the two glaucomatous attacks the aqueous was partially replaced by the gradual escape of vitreous through the pupil into the anterior chamber and resulted in a certain degree of filtration angle obstruction. The question as to whether this form of glaucoma is always preventable can be answered in the negative. Its cause is accidental, and an occasional accident will happen in any surgical procedure. In this operation it may in one case be due to a sudden and uncontrollable movement on the part of the patient, in another to faulty technic on the part of the operator, and, at times, it is possible that neither the patient nor the operator is responsible, but rather the presence of the vitreous body in such close proximity to the posterior surface of the capsule that its injury is inevitable if a capsulotomy is performed. In aiming to prevent this form of glaucoma it is important not to injure the vitreous body and also, if the accident does take place, not to increase the liability to glaucoma by evacuating the anterior chamber. In meeting this first requirement care should be taken to confine the incision as far as possible to the central portion of the capsule, where the vitreous behind it is more liable to be fluid, than toward the periphery, and also to avoid passing the knife-point too far backward. As to the second, the incision of the cornea should be made obliquely through the tissue and after the capsule is divided the instrument should be quickly withdrawn and in the same position as entered, especial care being taken that the cutting edge is not at right angles to the edges of the entrance incision. The accepted treatment of this form of glaucoma is the use of miotics, or, if this does not prove curative within a reasonable time, an iridectomy. Aside from the usual effect of miotics, it is not improbable that a contracted pupil may also act favorably, by preventing in a measure the entrance of fresh vitreous into the anterior chamber, as that already present becomes liquefied and is carried off. I am rather doubtful as to the necessity of iridectomy in these cases that are so apparently secondary to vitreous obstruction. If there is no pre-existing glaucomatous condition—and the fact that many cases are permanently cured by miotics favors this view—what is gained by an iridectomy? The rational treatment, it seems to me, is first the frequent use of miotics for three or four days in the hope that the vitreous in the anterior chamber will so far liquefy that it ceases to act as an obstruction, and second, if the glaucomatous condition is not reduced by this means, to make the usual corneal incision in preparation for an iridectomy. If vitreous is present in the anterior chamber, allow as much of it as possible to escape and then pass a spatula from side to side in front of the iris in an effort to break up what remains. In the exceptional cases where vitreous is not present in the anterior chamber an iridectomy should, of course, be performed.

# MICROPHTHALMIA.

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(Illustrated.)

Since Beer,[1] in 1813, drew attention to that condition in which the size of an eye is less in proportion to that of a normal person of the same age and development, and in which one or more defects are to be found in addition, much has been written and many cases recorded together with their pathological findings. In view of Parsons'[2] able exposition of the pathology, it would be idle for me to enter into a lengthy description of the details of this condition; suffice it to say that the concurrent anomalies so frequently to be seen may take the form of bodily deformities, diminished size of the head or face, defects in the orbit, such as smallness of the orbit itself, short eyelids, ptosis, and colobomata of the eyelids. The size of the eye itself varies considerably and may even be represented by quite a small piece of tissue connected with a comparatively large cyst. Vision is always defective; there may even be blindness. Colobomata of the iris and defects in the pupil are fairly common. Other anomalies may be present, but which are usually found on histological investigation.

In view of the absence of several of the usual accompanying defects I venture to record the clinical observations made on the following case:

Mary M., aged 13, was brought to the Ulster Hospital, Belfast, in October. 1907, on account of defective sight.

*Family History.*—No history of any eye affection in either of the parents nor among any of their relations, no consanguinity in the parents; one older brother has simple myopia, but no other abnormality in his eyes; one brother and one sister, both younger than the patient, have each good vision and neither show any ocular abnormality.

*Personal History.*—A seven months' child, who thrived fairly well for the first two years of life, at the end of which period she was able to walk; but then became the subject of rickets and was "off her feet" for three or four years.

*Present Condition.*—Patient is a very small girl for her age, and, except for a very deep voice, would at first sight pass for a child of seven or eight, and in some ways resembles a much younger child, such as by the toys she plays with, but she is bright and intelligent and does not show any sign of mental defect. She is said to be quick at learning and good at her work at school. That she has suffered severely from rickets is evidenced by the condition of her legs, there being marked bowing of the tibiæ and marked genu valgum. The size of the head is proportionate to that of the rest of the body, and does not show any swelling in the region of the occiput. The two sides of the face are of equal size, likewise the chest; the arms and hands are of equal length and size; there is no polydactylism. The permanent teeth are now erupting, and as the milk teeth have not yet been cast, the deformed and distorted condition of the teeth so frequently seen in rachitic children is well shown in this case. The left eye is considerably smaller than the right, as seen in the photograph, and appears to be about three-quarters of the size of the latter. The mother states that as the child has grown there has been a certain concurrent amount of

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[1] Das Auge Wein.

[2] The Pathology of the Eye, vol. iii.

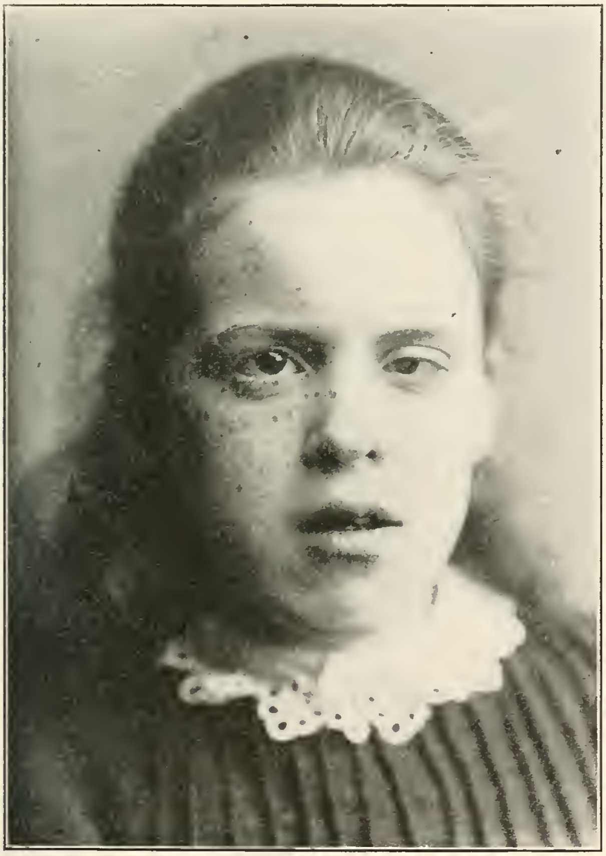

Figure 1.—Mary M.

increase in size of the left eye, therefore it has not remained stationary in size since birth: vertical measurements from the frontal to the malar bones show that the orbits are of equal size; the width of the two palpebral apertures are equal in size, but when the child opens her eyes so as to look straight to her front, as in the photograph, the free margins of the left lids are actually 3 mm. closer together than the right. Both lids of each eye are apparently normal in size, as they easily meet when she closes her eyelids, thus showing that there is no shortness of either upper lid. There is apparent ptosis of the left upper eyelid, as seen in the photograph, but both upper eyelids move synchronously and synergetically, there being no loss of power in the left lids. There is no coloboma of either lid. There is no defect nor paresis of the ocular muscles, for the movements of the globes in all directions are good; still, extreme movement to the left with the left eye is slightly deficient. There is no nystagmus, a constant convergent concomitant strabismus is present and the child fixes with the right eye. The shape of each cornea is in apparent normal relation to the shape and size of each eye, both are perfectly transparent and neither presents any flattening, but the horizontal diameter of the left cornea is 2.5 mm. less than that of the right.

The anterior chamber in each eye is well formed and clear. The irides are both present and complete, as neither shows a coloboma, nor is there corectopia in either eye; there is neither seclusion nor occlusion of either pupil, both of which react readily to light.

In the right eye there is a deeply placed lenticular opacity and in the left considerable opacity of the lens substance, with an anterior polar cataract.

R. V. = 6/ix but fingers easily in 1.5 meters.

L. V. = perception of light and dark.

No fundus reflex was obtained under atropin in the left eye, the lenticular opacity being too dense. The right lens showed a posterior centrally placed cortical cataract; it was surrounded by sufficient clear lens substance to enable one to examine the fundus. No hyaloid artery could be discerned, nor any coloboma of the optic nerve, nor of the chorioid. The fundus was of a myopic type, as the pigment layer was very poor and the chorioidal vessels could be plainly seen. Retinoscopy showed the error of refraction in the right eye to be $+\frac{-8.5}{-5.5}$ vision in this eye when wearing — 4 Sph. — 2 D. cyl. ax horiz. = 5/xxx. and ordinary print fairly well at ten inches.

This case certainly shows bodily deformity, but only that due to severe rachitis and not to any defect of development. An important point is that both orbits are of equal size; the arrested development of the eye, therefore, has not extended to the long walls of the orbit: this is especially interesting in view of the theory that the presence in the orbit of an eye is necessary to ensure enlargement of that cavity as growth proceeds, and therefore that an eye should not be enucleated in a child, if possible to avoid it. However, perhaps even a microphthalmic eye is sufficient to stimulate the normal expansion of the orbit. Contrary to what is so frequently found, neither the eyelids nor the iris show any defect, usually there is some anomaly in the iris such as a coloboma, but this case shows a perfectly-formed and normally reacting iris. Unfortunately, owing to the dense opacity of the lens, no view of the fundus in the left eye could be obtained, so the presence of any defects situated posterior to the lens could not be ascertained. However, the presence of an anterior polar cataract in the left eye is of importance, suggesting that inflammation has previously existed in this eye, though the normal appearance of the cornea is hardly in keeping with this hypothesis, therefore this case will not assist much in deciding the controversy as to whether the condition of microphthalmia is due to a defect of development or to a past inflammation.

# CASE OF PAPILLOMA OF THE CORNEA.

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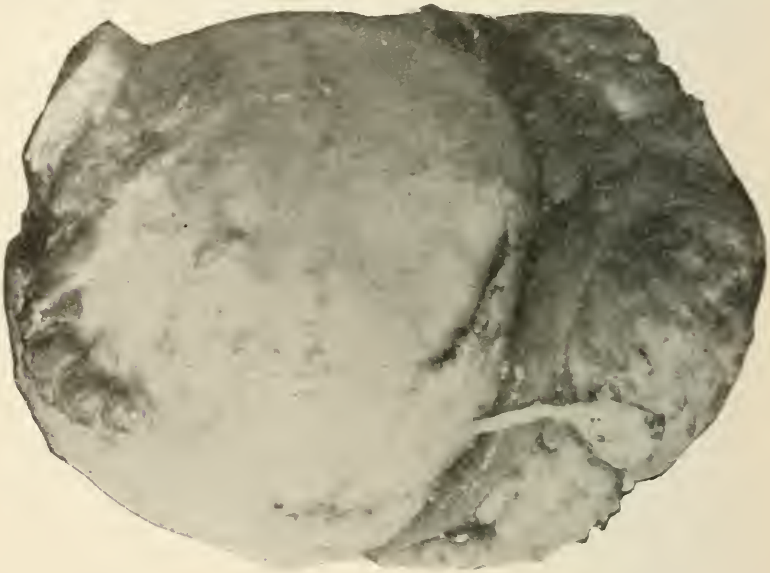
(Illustrated.)

November 4, 1907, I was consulted by Mr. P. M———, aged 43, a hearty looking farmer of about 180 pounds weight and apparently in perfect health. He was unable to close the lids of his left eye because of a growth of a cauliflower appearance which looked about the size of one-half an English walnut. There was not nor has there ever been any pain.



Papilloma of the cornea.

The growth started at the outer sclero-corneal margin (limbus), and has been growing for three years. It measured about 6 cm. in diameter and about 4 cm. in thickness. It is strongly attached to the cornea and sclero-corneal region, and seems to implicate slightly the internal rectus tendon. I enucleated the eye November 4, 1907. The eye was hardened in formalin and Dr. H. L. Begle, of Detroit, made the following report:

The tumor consists of nodules of epithelial cells apparently arising from the conjunctiva of the bulb in the neighborhood of the limbus. The cells, polyhedral in shape, with large oval nuclei, are similar to the epithelial cells of the bulbar conjunctiva.

In the extension of the tumor over the cornea, irregular branches of tumor cells invade the superficial layers of the cornea. The connective tissue stroma of the tumor, small in amount, is most abundant along this zone of invasion, and is marked by an infiltration of small round cells. The sclera is not to any extent involved. Numerous areas of cornification are to be seen in the outer and older parts of the tumor.

A perfect fac simile of this case was published in the Transactions of the Ophthalmological Section of the American Medical Association for 1891 by Dr. S. C. Ayres, of Cincinnati.

# EXTIRPATION OF THE LACRIMAL SAC, WHEN AND HOW?

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There is a trend toward conservatism in ophthalmic surgery, which at the present time, in cases of tear sac disease, is not, according to my opinion, justified, considering the results obtained by more radical measures in removal of the diseased organ. The operation is not a new one, but the indications and technic have made it of increasing importance in its bearing to the practice of ophthalmology.

Let us consider some of the most important conditions where operative procedure is justified.

In all cases of stenosis of the lacrimal duct (no matter how insignificant), where an intra-ocular operation is necessary. The chronic cases of conjunctivitis which exist in many patients with cataracts, can only be overcome by a complete extirpation of the sac. If the sac is removed *in toto,* the conjunctivitis treated over a period of two weeks, the extraction can be attempted with impunity and little fear of infection.

Cases of serpent ulcer, or any ulceration of the cornea where an old blennorrhea of the sac prevails. The secretion expressed from the sac under these conditions is far from sterile, and this, reinfecting the wound in the cornea constantly produces grievous results.

Fistulæ remaining after an acute dacriocystitis. These usually refuse to heal and leave an unsightly granulating opening. If the tract is removed, together with the sac into which it runs, the wound heals in short order and the patient is freed from his exasperating trouble.

Chronic blennorrhea of the sac, usually due to a stenosis of the lacrimal duct. In this condition frequent sounding very often leads to a favorable termination, but the length of time required is tedious and the patient refuses treatment before a definite result has been reached. Besides, no matter how carefully the sounds may be used, the pain is excruciating, and to undergo this over several months is no small matter. Where the patient is a workingman who has little time and less money, the extirpation, where a result is obtained in several days, is, of course, the advisable therapy.

Tumors of the sac, many of which are malignant, is another indication, and several of these cases have been lately reported. Lafon[1] describes an epithelioma, Rollet[2] two cases of carcinoma, and in another paper [3] reports three cases, the first an atypical epithelioma in a woman 65 years of age, the second a carcinomatous polyp in an elderly male. The third case was a melanotic sarcoma of the chorioid secondary by continuity grown into the tear sac. The diagnosis is a difficult one and a radical operation is essential, as much harm can be done by sounding. Cases of lymphoma of the sac reported by Sulzer and Duclos[4] also demand extirpation for cosmetic effect.

Epiphora. There are a certain number of cases of this condition which refuse to succumb to any treatment. Examination shows that the lacrimal duct is patulous, and that the tear gland is not enlarged. Astringents, probing, removal of the lower tear gland, all fail to show a beneficial effect, and in these cases the extirpation often works well. There appears to be a neurological connection between the walls of the sac and the secretory apparatus of the eye, not only with the gland, but also with the goblet cells of the conjunctiva, so that after the removal of the sac the secretion is greatly diminished without the danger of a xerosis intervening.

In cases of trachoma Kuhnt[5] starts all his treatments in this way. When a patient presents himself the drainage of the lacrimal apparatus is first investigated with fluorescin and a large syringe. If there is a trace of stenosis present the sac is extirpated. The chief reason for this very radical procedure is the fact that Kuhnt has found pathologically the tear sac to be affected with trachoma in a large percentage of the cases; in fact he went so far as to consider the starting point of the disease exactly in this location.

In the more recent literature we find several papers dealing with the subject matter in question. Markbreiter,[6] considering stenosis of the duct, has made the following assertions: Probing can, at the best, never bring about normal drainage, partly because the patient is unwilling to submit to the protracted treatment and partly, since the anatomical changes occurring in the canal prevent probing having its healing effect. Histological examinations of extirpated sacs show the cylinder epithelium of the normal sac changed to goblet cells in the dilated diseased part, certain cells undergo mucoid and fatty degeneration, are missing entirely in certain parts and their place taken by a granulating mass which protrudes into the cavity of the sac. The tunica propria was found in a state of round celled infiltration in many cases.

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[1] Lafon: Epithelioma du sac lacrymal recidive, Revue generale d'Ophth., p. 517.

[2] Rollet: Le cancer primitif du sac lachrymal, Lyon Med., May 20.

[3] Rollet and Auraud: Trois cas de cancer non ulcere du sac lachrymal, Archiv. d'Ophth., xxvi, p. 337.

[4] Sulzer and Duclos: Lymphome double du sac lachrymal Recueil d'Ophth.

[5] Kuhut: Therapie des conj. granulosa.

[6] Markbreiter: Ueber die chronische Entzundung u. extirpation des Tranensacke, Hungarian Szemeszeti lapok, No. 1.

Ulbrich[7] states the experience in this operation of the Prague Clinic with a report of 183 cases. Here the operation was done most often for ulcus serpens with beautiful results. It seems that over three and one-half million marks were paid for damages, due to serpent ulcer, by the German employers in the past thirteen years; since extirpation has been in vogue this has materially decreased. Primary healing followed in 90 per cent of the cases. The method I am about to describe was used and local anesthesia of similar mixture employed. Epiphora was relieved six to eight weeks after the operation.

The technic of the operation which follows is the one performed in Vienna Clinics and which has always proved an efficient beneficial operation.

This operation is always done under local anesthesia to avoid the local congestion, and subsequent hemorrhage which obscures the field of operation when narcosis is used. A 1 per cent. solution of cocain in a Pravaz syringe, to which one division of adrenalin has been added, is substituted in the following manner. The needle is inserted over the anterior lacrimal crest and directed upward and slightly inward subcutaneously for about one-third of an inch, and a few drops of the solution injected. The syringe is withdrawn and the needle is plunged to the bone just below the middle part of the canthal ligament and is directed downward, and the second third of the anesthetic mixture used, thus cocainizing the lower part of the sac. The same procedure follows, above the ligament, the needle being directed slightly upwards, the part is gently massaged for a couple of minutes and then the operation may be started with impunity, for when properly administered nearly complete anesthesia exists.

With an eye scalpel the first incision is made, cutting only through the skin, starting at a point just above the middle part of the canthal ligament and running downward and slightly outward over the crest. This bony prominence forms the chief landmark during the operation and its location must be constantly borne in mind. The edges of the skin wound are now slightly undermined and a Mueller speculum inserted to hold them apart. The floor of the opening is formed of the delicate superficial fascia, and this is easily divided with the point of a scissors. A toothed thumb forceps and a light scissors curved on the flat are now taken up by the operator and the muscle fibers of the orbicularis separated easily by blunt dissection, as these fibers follow the line of the incision. During this period an attentive assistant keeps the field of operation free from blood, using an anatomical forceps and a strip of gauze for tamponading. The opening is now quite deep in many cases, but below the tough deep fascia can be plainly made out. Just over the crista a snip is made into this fascia with the point of the scissors, and then inserting one blade into the opening a straight incision can be continued up to the canthal ligament. This ligament may now be severed to enlarge the field, but when done earlier there is a tendency toward hemorrhage from the large veins lying just above. Between the edges of the split fascia lies the pink sac. The fascia is grasped in the forceps to the outer side, and with closed scissors the wall of the sac is gently dissected away from the orbital fascia, taking care to avoid penetrating this, lest a hernia of fat should contract the view and even lead to a subsequent cellulitis. The nasal edge of the fascia is then fixed and with the scissors the inner wall of the sac is freed from the periosteum of the lacrimal bone. The canaliculi are divided close to the sac and the under surface is easily freed by the blunt dissection close to the bone. The assistant now retracts the upper angle of the wound by means of a small sharp double hook. The body of the sac is firmly grasped with the forceps and the vault dissected loose with a few cuts of the scissors, keeping close to the bone, and now only the connection with the lacrimal duct remains. With the sac between the blade, the scissors is inserted into the duct and the cut made as low down as possible.

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[7] Ulbrich: Zur therapie der chronischen Tranensackeiterung. Prag. Med Wchnschr., xxxi, No. 21.

The sac comes away and a sound is passed through it to determine whether it is intact or not, and in 95 per cent. of the cases a gratifying result is realized. A large Bowman sound is passed into the duct through the wound opening and this followed by a sharp curette with which the entire diseased mucous membrane is extirpated. The cavity is washed with 1-1000 bichlorid and dried with gauze. The skin margins are made tense by traction upon sharp hooks in each angle and three silk sutures bring the edges together, good apposition being most desirable, for in such a case the scar is never visible. A piece of gauze with vaselin is laid above, and a small roll of iodoform gauze is used to exert pressure over the area, thus obliterating any of the dead spaces. A compression bandage and the patient goes home to return in two days, provided there are no symptoms. Sutures removed upon the third day, a little dusting powder, preferably xeroform, and the case is completed. Uninterrupted recovery in a week.

I should like to report briefly three of the recent cases I have done as illustrating three different indications:

Case 1. Patient, a man 67 years of age, with typical serpens ulcer, starting at the inner limbus and spreading toward pupillary area. Pressure on the tear sac caused large quantity of slimy secretion to escape. Bacteriologically this was found to contain large quantities of pneumococci and staphylococci. Immediate operation advised. Sac extirpated according to above method. Ulcer then cleaned with galvano-cautery. Atropin and bandage. After five days ulcer was healed and wound closed by primary union.

Case 2. Working man suffering from blennorrhea of the sac for past two years, from which a stream of pus could be constantly expressed. Had been probed for two months and was tired of treatment, which he declared was very painful. Sac removed and condition relieved to the satisfaction of the patient, who was also advanced in years.

Case 3. Woman 51 years of age complained of epiphora. Examination showed slight stenosis of lacrimal duct with chronic conjunctivitis. Lower canaliculus split and probing resorted to. This had been unavailing in the hands of a former oculist. After a time No. 5 Bowman passed without much difficulty, but epiphora still remained. Decided to extirpate lower lacrimal gland. This was done with no better result. After considerable persuasion I attempted the extirpation of the sac. Normal course and for two weeks following the operation thought I had failed in a result. Patient was not seen again for two months, when she returned to state that, although not entirely cured, still her tears no longer overflowed and that the need of constantly drying her eyes was dispensed with.

Summing up the condition, let me quote the four chief indications for the operative removal of the tear sac in the words of Gendron:[8]

1. Old dacriocystitis with changes in the walls and more or less severe ectasia.
2. Flow of pus, which has been handled by other methods over a period, without results, especially in the laboring classes.
3. Complicated with corneal ulcers upon the same side.
4. Preceding intraocular operation.

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[8] Gendron: Ablation du sac lacrymal, ses advantage et ses indications. L'Ophthalmologie provinc., p. 143.

# THE OCULAR SYMPTOMS OF ETHMOIDAL DISEASE.*

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The proper diagnosis of growths of the orbit is often a matter of great difficulty. The preponderance of mucocele and pus collection in the inner angle of the orbit as the causative factor of exophthalmos is being recognized more and more.

An earlier diagnosis and operation of the ethmoidal disease could in many cases avoid the formation of collections of exudate in sufficient amount to cause such deformity and the dangers resulting from pus near the optic nerve.

The writer some years ago was called to see a young child suffering from extreme bilateral exophthalmos, the left eye being slightly more prominent than its fellow. Both eyeballs were apparently immovable, and were directed somewhat down and out. The pupils were immobile, dilated, the patient being unconscious. The child had been treated for some weeks by an oculist for lacrimal disease and catarrhal conjunctivitis of the left eye. There was some evidence of such a disease present at this time but of a minor grade. The temperature was 106 to 107, the pulse very weak. Immediate operation disclosed pus beneath the periosteum of the orbit on the left side, and an opening was made into the nose. The patient died, however, about ten hours later, without having regained consciousness.

As the writer was compelled to leave shortly after the operation he was unable to make an autopsy. This case is merely mentioned as it suggests possibilities from an earlier diagnosis.

The following cases have some points of unusual interest:

CASE 1.—Myrtle Stevens, aged 5 years, reported at St. Christopher's Hospital for Children on Sept. 18, 1906, with the history that the left eye had been inflamed for ten days, for which she was treated by her family physician. She had previously had a severe cold, cough and running of the right ear. The swelling of the left lid was gradually becoming more marked.

At this time there was intense edema of the left upper lid, extending to forehead and behind to the left ear. There were numerous ecchymoses of the conjunctiva, but the cornea was clear. There was marked conjunctival catarrh. Antiseptic lotions were prescribed, associated with moist heat.

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*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, April 16, 1908.

When seen two days later the temperature of the mouth was 100.6, the edema was intense and apparently pointing in the center of the upper lid. An incision was made above the cartilage of the lid, evacuating a very large quantity of pus apparently from beneath the occipito-frontalis muscle. Large quantities of pus continued to drain from the wound for about one week. Examination of this pus showed a great preponderance of streptococci.

On October 10 there remained some edema of the upper lid, inner and outer canthus, and on the forehead above outer canthus and behind the left ear, greatly resembling the edema of infection erysipelas. When opened a watery fluid oozed out, in which streptococci were again noted.

An ointment of ichthyol 50 per cent. was ordered to be applied locally, and the edema disappeared gradually.

On November 2 the mother noticed that the left eye had a tendency to turn in. This became very marked after several weeks and remained convergent about 45 degrees. Off and on a slight edema appeared in various places on the left side, namely, the temporal region and behind the left ear especially, rarely directly above the root of the nose, but never in the inner angle of the orbit. An application of ichthyol ointment in a few days removed the difficulty.

It was impossible to judge of its tenderness to pressure, as the child was always irritable and crying when in the clinic. The patient was sent to the nose dispensary for diagnosis, and was lost sight of for several months. I learned since that she was then operated for the removal of adenoids. The nose examination was stated to be unsatisfactory on account of the irritability of the patient.

The swelling continued with intermission of one to three months, each time lasting a few days, until in August, 1907, when a marked swelling appeared in the inner upper angle of the orbit above the lacrimal ducts. This swelling was hard, reddish and very tender, with a tendency to steady increase in size.

She was admitted to the hospital. After shaving off the eyebrows a curved incision was made extending along the supraorbital ridge to nasal crest, extending along the latter to about the level of the lower lid. This cut extended to the periosteum which was then elevated with a periosteal elevator. The periosteum was tightly adherent to the orbital bone until the growth was reached, when there was a gush of pus. Palpation with the finger disclosed a small flat sequestrum, about 4 mm. round, of the outer plate of the inner orbital wall, which was removed. A probe readily entered the cavity of the ethmoid cells. The frontal cell was poorly developed.

The dead bone was curetted and a large opening made into the nose through which a drainage tube was introduced. The wound was stitched, and healed by first intention. The drainage tube was washed daily and removed on the third day. The convalescence was uneventful. The patient has had no return of her former symptoms. Under the use of strong spherocylinder lenses her left eye has lost its convergent squint, rendering it probable that the latter was of the concomitant variety.

Case 2.—Annie Harkness, aged 7 years, reported at St. Christopher's Hospital, stating that she had recovered from measles two weeks before. Three days ago the mother noticed a swelling in the corner of the left eye. The child had had no previous ocular trouble.

The condition present was as follows: Marked chemosis of both lids of the left eye, especially marked in the upper lid. In the upper inner part of the orbit, posteriorly, was a swelling the size of a hazel nut, which was tender to the touch. The eye was otherwise normal.

The nasal examination showed both middle turbinates covered with a crusty discharge. The septum and vestibule were ulcerated and crusted. After cleansing, a small quantity of pus from above middle turbinate anteriorly on the left side was seen by my assistant, Dr. Bachman. The eyegrounds were negative, and there was no marked exophthalmos.

Under the use of heat and atropin the swelling of the lid subsided, but the hard dense tumor remained deeply embedded in the orbit. She was operated upon as in the preceding case. The carious area was in the region of the os planum, and the probe readily entered the posterior ethmoid cells. A large opening was made in the nose and drainage introduced.

The following day the tube was filled with flaky pus, likewise the pathway alongside of the tube and in nearly every stitch hole, but with no redness, as in acute infections. This condition yielded readily to thorough cleansing with bichlorid 1 to 4000, neutralizing the irritating effect on the nasal mucous membrane with normal salt solution immediately afterward. By inclining the head forward the solution would only come in contact with the anterior nares. Moist dressing was applied. Healing was uneventful, the patient being discharged one week after the operation. The tube was removed early, as the opening into the nose was large and lined by the periosteum up to the orbital margin. Cleansing into the nose was readily done after removal of the tube. The scar was very small, scarcely perceptible.

Case 3.—M. Z., 11 years old, reported on April 2, 1908, with the history that one week before the lids of the right eye and the inner part of the orbit were greatly swollen. This subsided without treatment in two days. Recurrence of the swelling appeared yesterday, and is greatly increased to-day. Suffers from frequent attacks of acute rhinitis, both nostrils being affected. She had no pain.

When the patient presented herself there was a marked edema of the inner orbit, both lids, and forming a marked sacculation over the malar bone. There was marked tenderness over the inner wall of the orbit. The external ocular muscles and iris were normal. The vision of the right eye was 5/vi and the left eye was normal.

The upper and lower edges of the disc of the right eye were distinctly hazy, and a number of tiny glistening spots were seen apparently in the internal limiting membrane. The left eye ground was normal.

The nasal examination showed a marked fullness of the middle turbinate bone, especially posteriorly. The nasal discharge was thinner and more watery than in the opposite side.

Atropin was prescribed in the form of eye drops and used three times daily. Moist heat was applied externally. Two days later the condition had entirely disappeared, the tenderness on pressure being very slight.

Case 4.—Merchant, 51 years of age, had suffered for many years with intense supraorbital pain over the left eye, extending later over the right side, usually beginning in the prelacrimal regions. Acute coryza when present aggravated the severity of the attacks, which were almost constant in later years and which necessitated rest in bed two or three days weekly.

The patient had been to see an eye specialist who prescribed glasses without effect. He had upon advice of his physician consulted a throat and nose specialist, who stated that his nose was not the cause of the trouble. When referred to me by his physician, my friend, Dr. Pfromm, he had one of his severe attacks.

The left lids were slightly chemosed, the conjunctival vessels were full, the eye grounds were normal with a myopia of 2 diopters. There was tenderness along the inner wall of the left orbit, but no swelling. The ethmoidal bulla was very large, the middle turbinate swollen and pressing upon a high spur on the septum on the left side. A small amount of pus exuded behind the bulla. The anterior ethmoidal cells were opened thoroughly, including removal of the anterior two-thirds of the middle turbinate bone. A characteristic odor was exhaled when these cells were opened.

The healing was uneventful, and the patient has been practically free of headache, though taking much less care of himself than formerly, as he wishes to find out whether the pains can be made to return. It is too early in this case to judge of the permanence of cure (six weeks since operation), but similar cases in the author's practice have experienced permanent relief.

In the first case the symptoms seemed to point to an infection of the deeper subcutaneous tissues, resulting in abscess of the orbit pointing through the center of the upper lid.

After evacuation of the pus there was edema resembling that of erysipelatous infections which appeared most frequent in the temporal and parietal regions.

The wound in the lid, though not discharging, kept an appearance of a sinus entrance. Frequent observations were made, as the possibility of sinus disturbance was constantly held in view. But no definite conclusion could be reached until nearly eleven months later, when the diagnosis seemed beyond doubt. Streptococci formed the infecting organism.

In the second case the acute symptoms subsided. Nevertheless, upon operation the virulence of the organism was shown by immediate infection of the wound. Unfortunately, the bacteriologic examination was overlooked.

The third case shows the rapidity with which the earlier forms of acute serous ethmoiditis will disappear.

The fourth case illustrates how prelacrimal and supraorbital pain can be very intense, though signs of purulence may be largely absent. It is probable that in these cases there is closure of the usual avenues between the cells, which allows an aërogenic organism to cause a gaseous pressure which is aggravated by any swelling of the mucosa due to the so-called "colds."

The ocular symptoms of ethmoidal disease may be classified into objective and subjective. The objective symptoms may be further divided into external and ophthalmoscopic. The external symptoms are, briefly, tenderness to touch, edema, tumor, exophthalmos, fistula. The earliest symptoms are edema and tenderness to touch. The fulness or edema begins in the upper anterior part of the orbit, gradually or at once involving the upper lid, at times causing the appearance of ptosis. The lower lid is slightly chemosed, ofttimes becoming markedly baggy, especially at the outer infraorbital margin. The subcutaneous tissues are apparently filled with serum. The root of the nose is slightly swollen. In mild cases, under treatment especially, the symptoms subside.

Extension is noted by the formation of an edema, greater intensity in the upper inner angle of the orbit, a slight tumor formation being evident upon deep pressure alongside of the nose next to the eyeball. If pus is forming the tenderness always present in this location will be rendered more intense and the skin assumes a deeper hue.

Ofttimes the condition improves temporarily. The edema disappears, but the tumor is evident upon pressure upon the nasal orbital wall.

The external edema may then be replaced in a subsequent attack by edema of the orbital tissues, causing exophthalmos of varying degrees. Most frequently, however, there is accumulation of fluid, consisting of pus or mucus beneath the periosteum. This fluid can not penetrate the dense membrane, forming a mucocele or pus collection. In this way is formed the large tumor over the os planum which bulges the eye forward, outward and somewhat downward.

This exophthalmos is at times so great that the eyeball is fixed in this position with immobile, dilated pupil and blanched optic nerves. Occasionally a fistulous opening is made by Nature in an attempt at relief, whereby the pus is discharged. This sinus, when probed, leads to carious bone.

This fistula may be in various places along the inner wall of the orbit, sometimes causing a resemblance to prelacrimal abscess or purulent dacryocystitis. Careful probing will usually reveal a carious weakness of the bony wall of the nose, permitting easy entrance into the nose. In the latter cases the anterior ethmoidal cells are involved, while in the exophthalmos and tumor formations the posterior cell involvement is indicated.

The significant symptom in the early stages of ethmoiditis is tenderness on pressure above the superior lacrimal ducts and deep on the internal surface of the orbit. This should be guarded by similar pressure on the opposite side to eliminate pain from simply the pressure.

Symptoms of conjunctivitis, lacrimal irritation, chemosis of the conjunctiva, and especially symptoms of toxic affections of the optic nerve are frequently seen in the more severe cases.

The ophthalmoscopic appearances may vary from negative to edema of the nerve and retina, and optic atrophy. Ordinarily the lymphatic vessels accompanying the retinal arteries and veins become visible and expanded, and appear as white lines on each side of the vessels.

When the extreme proximity of the posterior ethmoidal cells to the optic nerve, the readiness of involvement of the sphenoid from the posterior ethmoid cells, and the extreme thinness of the separation of these sinuses from important ocular structures, as so well pointed out by Onodi,[1] it is readily seen how inflammation and atrophy of the optic nerve can ensue.

The subjective symptoms are pain and symptoms caused by pressure, edema, toxic absorption and other complications.

Pain when the ethmoidal cells are involved is more or less constant, increased by a stooping position and is usually worse in the morning. Its location is stated to be at the root of the nose, the inner surface of the orbit, deep in the orbit, "back of the eye," it is sometimes explained. Ofttimes the pain spreads to neighboring parts. This pain is aggravated by slight colds. The nasal symptoms are not strongly marked in the ocular types of ethmoiditis.

Symptoms of conjunctivitis, ptosis, diplopia, dacriocystitis, fistula, optic nerve stretching, choked disc, optic atrophy, musca, flashes of light, blindness, hemianopsia, central scotomata, contraction of the visual field, are sometimes present. When the brain or meninges becomes involved, irritability, hebetude, insomnia or somnolence are common symptoms. Should the infections in these cases result in purulent inflammation, death would ensue.

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[1] Onodi: Der Sehnerv und die Nebenhoelen der Nase, 1907.

To name all the possible symptoms due to complications of ethmoiditis would be a task far beyond the limit of this paper.

Cramer[2] reports a case of acute purulent ethmoiditis associated with empyema of the antrum, and frontal disease resulting in necrosis of the anterior wall of the latter, penetration of the ethmoiditis into the orbit, causing exophthalmos, and a fistulous opening alongside of the cornea. The latter became infected and the eyeball finally lost.

Onodi[1] states that in empyema of the ethmoidal cells asthenopic symptoms were observed by Burge, Caldwell, Hajek and Grünwald.

Retrobulbar neuritis, choked disc, dacriocystitis purulenta, exophthalmos, intermittent exophthalmos, orbital phlegmon, orbital abscess, intracranial and cerebral complication have been observed.

Birch Hirschfeld,[3] in an analysis of 684 cases of orbital inflammation, found 409 (59.8 per cent.) due to disease of the nasal sinuses. Of these cases 83 (20.5 per cent.) were due to ethmoidal disease, and in 60 others the ethmoid cells were involved with the frontal, sphenoidal or central cells.

Birch Hirschfeld[4] believes that the discovery of a small central scotoma is of great diagnostic import in doubtful cases. It indicates inflammation of the posterior ethmoidal or sphenoidal cells. It is brought about by venous congestion and toxic action on the papillo macular bundle posterior to the entrance of the optic nerve, making it a retrobulbar neuritis. A similar condition was observed pathologically by him in a case of carcinoma of the posterior ethmoidal cells.

Knapp[5] reports a case presenting symptoms of pronounced optic neuroretinitis, with a radiating figure of white lines and dots about the macula. There was relative scotoma for white and colors of 5″. The vision improved from 20/lxx to normal after operation upon the middle turbinate bone, opening the posterior ethmoidal cells.

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[2] Klinisch Monatsbl. f. Augenheilkunde, 44, p. 69.

[3] Klinisch Monatsbl. f. Augenheilkunde, xlvi, p. 1.

[4] Von Graefe: Archiv., vol. lxv, No. 3.

[5] Archives of Ophthalmology, vol. xxxvii, No. 1.

Onodi points out that the intervening wall between the posterior ethmoidal cells and the optic nerve or orbit may be as thin as tissue paper. This proximity readily explains optic nerve affections.

To assist in the diagnosis of tumor of the orbit, Cirincione[6] suggests aspiration with thick Pravaz needle. In two cases reported by him this method was tried with success. In the first case only blood was aspirated, though the needle penetrated into the ethmoidal labyrinth. Operation by another surgeon for mucocele showed the growth to be sarcoma. In a second case a mucocele could be diagnosed by the aspiration of mucus and was verified by operation. The diagnostic use of the *x*-ray has been suggested by several writers.

Oppenheim[7] relates a case in which exophthalmos had existed for five years. A short time before presenting himself the patient had symptoms of acute phlegmonous inflammation. The *x*-ray established ethmoidal frontal and sphenoidal abscess. Radical operation was at first refused, the patient improving under local treatment. A fistula from the frontal cells continued to secrete pus. The patient then permitted the radical operation, after which the exophthalmos disappeared.

The use of the *x*-ray in examination of the nasal sinuses has also been shown by Caldwell, Coakley, Tousey[8] and others.

The treatment in the early stages in the serous form consists of atropin solution gr. iv to ℥i instilled into the eye three times daily. In cases of necessity, atropin by the mouth might prove sufficient. Moist heat externally gives relief and hastens absorption. When pus has formed, the following operation in the author's hands has given the best satisfaction, the resulting scar being practically imperceptible:

An incision is made alongside the crest of the nose on the affected side, beginning on a level with the lower lid and extending upward to the eyebrows, then through the center of the brows to the supraorbital notch. The eyebrows should be previously shaved and the parts made aseptic, according to the usual surgical principles. This curved incision should be made deep, and the soft parts separated sufficiently to work on the periosteum at the upper and inner orbital margin. The periosteum in this location is separated from the underlying bone of the orbit through a channel of varying widths until the tumor is reached. In many cases evacuation of the contents of the tumor can be made through a narrow channel. A probe is then introduced to discover any carious areas of bone or abnormal openings into the ethmoid cells. Usually such are found. By means of a gouge this opening is enlarged until all carious bone has been removed and a large opening exists into the nose. After tying a drainage tube securely to the eye of a blunt probe the latter is introduced through the wound into the nose. If the posterior cells are involved it is best to bring the probe into the posterior nares, where it is felt with the finger introduced into the post-nasal space, and drawn out through the mouth. The drainage tube should be well notched with openings. The tube should be cut so that it rests on or above the soft palate. It is secured above by means of a safety pin.

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[6] Klinisch Beilage, Heft. p. 206.

[7] Klinisch Beilage, Heft, p. 358.

[8] New York Medical Journal, vol. lxxxvii, p. 13.

After thorough cleansing of the tube and cavity of the tumor with a 1 to 5000 bichlorid of mercury solution, the periosteum is brought back to place and the wound neatly stitched, with the tube directly up from the opening in the orbital bone. The tube is washed daily, the liquid passing into the nose. When the patient breathes through the mouth with the head held well forward the fluid passes out of the nose. A dressing wet with 1 to 3000 bichlorid of mercury solution is placed in contact with the wound and about the tube. The tube and stitches can usually be removed on the third day, as healing is very rapid.

The important thing in operating on these cases is early interference, a careful dissection of the periosteum, the removal of the dead bone and a large opening into the nose for drainage. Direct incision into the tumor, in the writer's estimation, should be avoided, on account of greater prominence of the scar and danger of further infection, and perhaps greater difficulty in reaching the affected bone, which may be considerably posterior to the tumor formation.

# A SOLUTION OF DR. GEORGE T. STEVENS' "NEW PHENOMENON OF COLOR CONVERSION."*

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*Physiology is, in its broad meaning, the unraveling of the potentialities of things in the condition which we call living.*—MICHAEL FOSTER.

In *The Journal of the American Medical Association*, July 21, 1906, Dr. Stevens describes a "new phenomenon of color conversion" thus:

"If in the midst of a somewhat broadly extended surface of given color, a narrow stripe of complementary color is seen, the narrow complementary color stripe, when viewed with a fixed gaze, will be eliminated from the field to be replaced by the color of the more extended surface." Stevens says further: "These two factors, the difference of the refractive character of the two colors and the adaptation of the eye through the accommodation to certain conditions of refraction may, it would appear, be accepted as elements of the phenomenon, but there remains a factor still undetermined." He then describes experiments suggesting the direction in which we may look for this missing factor.

In the discussion following—well worth reading from a psychological standpoint—no definite solution is given, but only suggestions of the bleaching effects of the visual purple, and the nonacceptability of the accommodation playing a part in it, or "something that comes nearer to suppression of the image of one eye than anything else." Fatigue of the retina was excluded by every one. (Reviewed in OPHTHALMOLOGY, October, 1906, p. 169-170.)

Stevens states: "We may premise that it is not a color illusion but an objective phenomenon," in my mind wrongly, for I consider the conversion to be a subjective phenomenon, just as 'colors' are not objective, but purely subjective phenomena. It was this which prompted me to search for a physiologic, or, rather, for a psychophysiologic explanation, which, I think, can be given with Hering's theory.

More than thirty years ago Ewald Hering presented to the Imperial Academy of Sciences at Vienna his theory of light phenomena (*Zur Lehre vom Lichtsinne,* 1872-1874), which theory had for many years only one serious competitor in the Young-Helmholtz-Maxwell theory.

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*Read at the meeting of the Buffalo Ophthalmological Club, January, 1908.

Hering gives a few fundamental facts:

1. Fixation of a light (white) spot on a dark (black) background produces after elimination of the excitation, that is, in the closed darkened eyes, a spot darker than the surrounding and bordered by luminosity. This phenomenon is due to *"successive light induction."* The greatest luminosity is seen closely surrounding the dark spot and gradually diminishes to the periphery. When two light squares are taken and put on a dark (velvet) background at a distance of about two to four millimeters, the after-image of the two squares is also surrounded by light, but the light between the squares is stronger than anywhere else. This intermediate brightness is due to the blending of the light from both sides.

2. When one fixes a stripe of gray paper on a dark background and then inserts a large white sheet between this stripe and the background the stripe will become much darker; on removing the white sheet the stripe becomes lighter again. This phenomenon is due to *"simultaneous light contrast."* In the after-image the difference in brightness is much greater than in the positive picture, and does not increase or decrease at the same time with the difference of brightness of the background.

3. There is a third class of phenomena due to *"simultaneous light induction."* When we fix a point at the limit of a black and white ground, we shall notice, after some time, that the deep black passes over into gray and that the white becomes darker. A piece of black paper on a white background becomes lighter. A black stripe on a light background will show even lighter than the surrounding white background after fixation when the illumination is diminished, as may be observed by pulling down the window screen.

In the beginning with fixation of a border line between bright and dark, the dark becomes darker still, especially in the immediate vicinity of the bright, just as it would be in the absence of the bright: *simultaneous contrast.* With continued fixation the darkening decreases and changes slowly into an enlightening, which is the clearest also at the border line: *simultaneous light induction.* This clearing remains visible for a long time, even when the surrounding illumination ("reagirendes Licht") is diminished or when the eyes are closed: *successive light induction.*

All three, as well as each one for itself, demonstrate that the excitation and sensation of a part of the retina depend not only upon the illumination of the part itself, but also upon the illumination of the rest of the retina. As to the colors, in the narrower senses, so much may be said, that the phenomena of induction and contrast, as shown for black and white or dark and bright, are produced in the same way for yellow and blue and green and red.

Our whole psychophysics rests on the basis, that a certain parallelism exists between physical and psychical behavior, and that particularly different qualities of the sensation correspond to different qualities, or forms, of the psychophysical behavior.

All living matter undergoes, under its specific stimulus, chemical (katabolic) changes, which correspond with function. This dissimilation or katabolism, or consumption is, when the excitation is physiological, followed by assimilation, anabolism, restitution (a synthetic process). We may accept that the white light produces dissimilation, and Hering now assumes that the assimilation produces black, contrary to Helmholtz, *cum suis,* who look upon black as a void or absence of light sensation. Mach and Aubert consider with Hering white and black as distinctly different sensations; each sensation having its own quality. When a part of the visual organ is excited by light, the remainder and especially the neighborhood perceives blacker (darker) than before, due to an increase of the assimilation, the strongest being in the very neighborhood of the spot excited by the external light, which decreases quickly with the distance, but which can not be exactly limited (simultaneous contrast). Dissimilation lessens the dissimilative material, but will stimulate assimilation, which produces new material for dissimilation and when the excitation remains constant a new equilibrium forms with a lower "weight" or potential, in which dissimilation and assimilation become about equal again, as at rest. (The weight of the sensation depends upon the absolute size of the excited assimilation and dissimilation). When it is true, that excitation of one part produces increased assimilation in the other parts of the visual organ—and that, again, most marked in the surrounding parts—it follows that two nearby parts, when excited at the same time by light, support each other in their assimilation.

Hering accepted three different visual substances with six different qualities: the white-black, the red-green, and the blue-yellow. White produces a sensation of its own, just as black, red, green, yellow, and blue. The sensation of white, or light, corresponds to dissimilation, while the sensation of black, or dark, to assimilation of the white-black visual substance. In all shades of gray we have the sensations of both white and black, while we have here an expression of the chemism (metabolism) of one of the visual substances. ("Was uns als Gesichtsempfindung zum Bewustsein kommt, ist der psychische Ausdruck oder das bewusste Correlat des Stoffwechsels der Sehsubstanz"). In the sunlight we have no black rays, hence black appears only under the direct influence of the light excitation, namely, through the so-called simultaneous, or successive, contrast. The light excitation does not act only directly by increasing the dissimilation in the excited parts but produces assimilation in their surroundings.

In the surrounding parts the assimilation first increases with the increase of the irritable substance, which produces the greater blackness: but through the diffused weak light from the background, the continuous internal excitations and the dispersed light from the light parts, the dissimilation will also increase, while the assimilation will slowly diminish, which means an increase of the (its) white sensation of the parts that were darkened before, which is expressed in the parts seen lighter (the simultaneous light induction).

That a fixed gaze is essential is shown by the fact that when the eye moves slowly the white becomes more distinct and the black at once becomes more black (successive contrast), because the white will meet a spot in the wandering eye where the assimilation was stronger and where, consequently, more material was present for dissimilation, the consumption of which larger amount produces the stronger sensation of white.

Hering considers red, green, yellow and blue as simple colors or "Grundfarben," in opposition to the compound colors. Red and green are antagonistic colors, as are blue and yellow, and so they exclude each other respectively. Why, we do not know. It is inherent in the nature of our visual organ. They can not be contained at the same time in a compound color. Colored light can produce only one of the two antagonistic colors to a relatively strong weight. Then when we mix in an exciting colored light a small quantity of another light which in itself would produce the antagonistic color, we find that we thereby weaken the action of the first light owing to the antagonistic action of both lights, and we lessen thereby the weight of the first color.

With the excitation of a colored visual substance an excitation of the black-white substance is always combined, whence it is that we see only a "nuance" of a color. An ideal pure (saturated) color can be only imagined, just as pure black or pure white. A pure color is as strongly related to white as it is to black, and that means that it is perfectly free of either. In general, the conditions for the distinct appearance of the colors in ordinary vision are rather unfavorable, owing to this mixture with the black-white sensation.

With not too excessive an illumination of one part of the visual organ the rest of it becomes blacker, especially the immediate neighborhood of the excited spot, as seen above, so, too, with the stimulation through colored light, the sensation of the antagonistic color surrounding the excited place becomes intensified and, under favorable conditions, will be perceived. The relations of the irritability in the neighborhood of the excited place change, as the sensation of some simple color comprises also a change of the relations of the irritabilities in disfavor of the perceived color and in favor of the antagonistic color. With the end of the excitation and the described contrastive action the irritability for the excited color will be less in the directly stimulated place than the excitability for the antagonistic color, while in the neighborhood, however, the opposite will occur. If now the retina be excited by light, which would appear colorless with neutral disposition of the visual organ, it will appear colored, namely, in the antagonistic color at the previously excited place (successive contrast), and in the same color as the original in the rest of the retina, being the most distinct in the direct neighborhood (successive induction). Excitation of a colored visual substance increases the dissimilative-irritability in the neighborhood of the directly stimulated place and after the stimulation the dissimilative-irritability will be greater than the assimilative-irritability.

For experiments in simultaneous contrast, the purest colors are less favorable than strong nuances, while with the purer colors the simultaneous contrast often very quickly passes over into simultaneous induction, or the dispersion of the colored light is so strongly over the colored spot, that the subjective antagonistic color has no power to oppose it. Color sensations are very transitory: they come easily under the threshold. A small colored square on a colorless background of about the same intensity with fixation of one point quickly loses its purity and, after a while, appears the same as the background which has mostly taken (through simultaneous induction) some of the color of the square, so that both square and background appear in the same weakly colored tone. Small colored spots disappear quickest in indirect vision, gradually in direct. However, on account of small ocular motions, the margins of the colored spots constantly appear again in the color of the square, i. e., in the antagonistic color.

In all experiments of color contrast, or color induction, the ("Stimmung") condition of the visual organ must be accounted for, which differs on account of adaptation for the somewhat colored illumination, so that the color which is antagonistic to the one predominating in the illumination, although it is imperceptible, mixes on every favorable opportunity and comes over the threshold, as soon as the total weight of the sensation just examined becomes sufficiently low, which often happens with diminished illumination, or on a dark background, especially in the darkened eye. Individual conditions, as the coloring of the lens and the macula lutea, must also be reckoned with.

With the above described facts, deductions, laws, and qualities of the visual substances we may now try to explain the phenomenon found by Stevens. His observations belong to the great class of phenomena due to simultaneous light-induction. As we have seen above, Hering described these as early as 1872; and we find a description, too long for quotation, in Hemholtz (Handbuch der Physiologischen Optik, first edition, page 388-414; second edition, page 537-566). H. Aubert describes the same in his "Grundzuege der Physiologischen Optik" (1876) on page 549-550.

Let us now take the green square with the red stripe. Both colors are complementary, or rather antagonistic, due to the two states of the red-green substance, assimilation and dissimilation. In his communication referred to, Hering did not commit himself as to which sensation was due to assimilation and which to dissimilation. Many writers seem to consider red (yellow) to depend on dissimilation, and green (blue) on assimilation. Stevens found that the phenomenon occurs most readily when the stripe is not too broad; he suggests two millimeters. The green being the dominant stimulus, induces in the intermediate stripe dissimilation, which at the beginning will combine with the dissimilation of the red, making it redder, but this dissimilation will excite assimilation in that part and consequently the assimilative material will increase here, which also augments the dissimilative material; now, as red and green are antagonistic and cannot exist at the same time, and since the green stimulus is so much stronger, the assimilative effect will, after some time, get the upperhand and the stripe will appear green. Quite favorable for the development is the fact that the weight of the green-red sensation diminishes on account of the large green stimulation, and a smaller excess of the assimilative effect will be necessary to show its effect. This process can account for different phases, e. g., that it is necessary to look with a fixed gaze, as thereby this struggle between assimilation and dissimilation becomes strictly limited. Focusing of the center of the green square produces quickest the color conversion, as the action finds place thereby in the somewhat indirectly perceived parts of the retina, and all parts are more equally distant from this center (the center of the fovea centralis is most probably color-blind). Fixation of a red square will make the most distant parts of the red stripe disappear quickest, while it is very difficult to see the focused red square green. At a glimpse it is seen that the color of the large field is the dominant stimulus; this can be verified if one succeeds in holding the impression of a single color a few moments (THE phenomenon), as then with closed eyes the after-image is one field in a single antagonistic color. The simultaneous color induction will be stronger when the space between the two stimuli (here the broadness of the antagonistically colored stripe) is not too wide, as summation from both sides must then happen easier, while dispersion of the dominant color may favor the process. Still dispersion can not play a decisive part, as the experiment is easier performed with subdued light.

When red is the dominant color, Stevens mentions that the phenomenon is not induced with the same ease as in the first instance (I can not find a continuous noticeable difference). Can this depend on the red being due to dissimilation, which induces assimilation in the narrow stripe and where the assimilation must be increased so much that more or less spontaneous action of the dissimilative material can not arise so easily?

"The comparative illumination of the two colors of a pair is to be regarded . . . while it is possible to induce the conversion of the color with various complementary pairs properly toned as to reflection of light, the excessive illumination of one of the elements in some complementary pairs renders the elimination of the subordinate color extremely difficult and in some instances impossible." (Stevens). This may be explained by the fact that different pigments (and Stevens nowhere mentions his having experimented with spectral colors) reflect the most different compound light, and also that the amount of white light is very different. (In the spectrum of diffuse daylight, yellow, for instance, possesses more white than blue. The yellow and the blue of the pigments is nothing other than reflected yellow or spectral blue, to which is added mixed colorless light, which will explain how yellow pigments generally appear lighter than the blue ones). A colored visual substance is never stimulated exclusively alone; the black-white substance is always, more or less, excited, too. We remark this also in Stevens' phenomenon, where the subordinate stripe passes through a darkened phase before taking the predominant color; this is the expression of the influence of the black-white sensation. The white lines around the small squares lessen the influence of the slight involuntary ocular movements.

I may be allowed to quote Hering's description of Simultaneous Light Induction: "Through the stimulation and increased dissimilation in the lighted parts the assimilation becomes increased into other parts, which means that these parts are seen darker. This increased assimilation produces now in the dark parts an increase of the irritable substance and also of the dissimilative-irritability. The continuing internal stimuli and the weak light coming from the dark background or the light dispersed from the white parts produce, therefore, a continuously increasing dissimilation, while the assimilation does not increase, but rather slowly decreases. This means a renewed increase of the apparent brightness in the parts darkened before by contrast. As, while the background becomes lighter through simultaneous induction, the lighter parts become slowly less light (bright) on account of the decrease through the stimulation of irritable substance and dissimilative-irritability, so before long the condition arises that the brightness of the background has increased by the same amount, by which the brightness of the lighter part has, at the same time, decreased; background and lighter parts go over in each other without distinction. It occurs more quickly in the peripheral parts than in the central, but in both cases careful fixation is necessary, as with every motion of the eyes the bright images move on the retina and their borders predominate more distinctly through successive contrast. . . ."

Our experiments with colors are generally too crude: pigments never reflect light of a single vibration, and without the most careful investigation we have not the slightest notion of the retinal energy of the stimulus.

I have been induced to deal so long with the conversion-phenomenon through the following words of Hering:

"Wenn es sich darum handelt für die verschiedenen Eigenschaften unserer Empfindungen passende und strenge Begriffe und Bezeichnungen zu erhalten, so ist das erste Erforderniss, dass man diese Begriffe lediglich aus den Empfindungen selbst abziehe and es streng vermeide, die Empfindung mit ihren physikalischen oder physiologischen Ursachen zu verwechseln, oder irgend ein Princip der Eintheilung dem Gebiete der letzteren zu entnehmen. Es ist auffällig, dass gegen diese eigentlich selbstverständliche Forderung noch immer verstossen wird, und dass wir daher vielfach bei Malern eine Objectivere Auffassung der Gesichtsempfindungen finden, als bei Physikern und Physiologen, ja dass sogar im gemeinen Sprachgebrauche in mancher Beziehung grössere Klarheit über den hier zu behandelnden Gegenstand herrscht als in der Literatur der physiologischen Optik."[1]

I believe that the men fit for solving kindred problems are not the philosophers ("I communicated it to Dr. George T. Ladd, professor of philosophy in Yale University, who in connection with Prof. E. W. Scripture made some observations in the Yale psychologic laboratory. In Prof. Ladd's report of these joint observations (1898) the elements of the appearance were not fully stated and no contribution to the elucidation of its nature or causes was made"), but the physiologists, or better physio-psychologists of the stamp of Hering, Mach, et al. One of the results would be that some topics for investigation would be eliminated as, for instance, why it is that we see objects in their natural positions, although their images on the retina are reversed. Nobody wants to "investigate" the fact that we see the left outer world with the right side of our retina, and vice versa (see OPHTHALMOLOGY, October, 1906, p. 134-5 and Mach: Die Analyse der Empfindungen, 3d edition, 1902. On page 30 he says: "Die Frage, warum wir die verkehrten Netzhautbilder *aufrecht sehen*, hat als psychologisches problem keinen Sinn. Die Lichtempfindungen der einzelnen Netzhautstellen sind *von Anbeginn* mit Raumempfindungen verknüpft, und wir nennen die Orte, welche den *unten* gelegenen Stellen der Netzhaut entsprechen 'oben.' Dem empfindenden Subject kann sich eine solche Frage gar nicht ergeben").[2]

So is the explanation by Dr. David W. Wells (OPHTHALMOLOGY, vol. iii., page 427) simply an elaboration of one of the first and principal rules of optics: all light processes are reversible.

As to an appreciation of Hering's theory I may be permitted to quote from Rivers, who treats on "Vision" in Schäfer's Text-Book of Physiology: "Hering has never regarded his theory as an expression of retinal processes. He states somewhere expressly that his theory has nothing to do with the first immediate changes in the peripheral organ. If Hering's substances are regarded as central, the difficulties to a great extent disappear. The existence of binocular color contrast suggests the central origin of contrast in general, and if spatial induction is central temporal induction has probably the same seat. Hering has not only left the actual seat of the psycho-physical processes undecided, but further, has only adopted the conception of three special substances in order to assist the exposition of his views. He would prefer to speak of only one psycho-physical substance, capable of manifold qualitatively different kinds of anabolism and katabolism, each kind being capable of analysis into three components, corresponding in three chief varieties of anabolism and katabolism. The strong point of Hering's explanation is that it brings temporal and spatial induction into the closest relations with one another; each of the two processes helps to make the occurrence of the other more intelligible. In both kinds of induction we may see the working of a general law, that the occurrence of destructive metabolism at once determines an increase in constructive metabolism, which hinders the living substance from undergoing too great or too rapid decomposition: and that, on the other hand, constructive metabolism determines an increase in the tendency to spontaneous decomposition, which sets a limit to assimilation and prevents it from reaching a degree beyond the needs of the organism."

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[1] Then the point in question is the different properties of one sensation to receive both slight and severe conceptions and characters, the first requirement is that we divide these conceptions from the sensation itself, and it is a strong supposition that the sensaton with its physical or physiological change is a misnomer in principle. It is a striking fact that these self-understood claims are always cast aside. The painters give us an object lesson in vision sensation and present the subject in greater clearness than in any literature found in the books on physiological optics.

[2] The reason we see the retinal picture upright has, as a psychological problem, no meaning. The light sensations of the retina are from the beginning connected with space sensation and we indicate the locality which is not perceived by the retina as above. The sensation subject can not produce such a question.

# *Abstracts from Recent Ophthalmic Literature.*

## AMBLYOPIA AND BLINDNESS.

A Little-Known Type of Amblyopia in Children.—Stephenson, Sydney, London (*Brit. Med. Jour.,* July 18, 1908), describes conditions which are often discovered for the first time in ophthalmoscopic early school life, and appear as post-papillitic and post-neuritic atrophy with incomplete or very slightly marked changes. They are invariably bilateral. There is often a history of cerebral or meningitic illness, marked by "fits," convulsions, headaches, vomiting, constipation. retraction of the head, squint. and so on. After recovery sight was partially or completely lost. but was regained later. This type must be distinguished from fleeting amaurosis and from post-eclamptic amaurosis. The former is met with in infants suffering from basal meningitis, and sight is wholly lost without ophthalmoscopic signs. Vision and health may both recover slowly (acute cerebral amaurosis, Gay). In the second class the essential cause of the amblyopia appears to lie in the convulsions, which may last hours, days or weeks. Blindness without ophthalmoscopic signs, and aphasia with more or less lasting hemiplegia, may follow return to consciousness. The underlying condition is probably a lesion of the cortical visual centers by the "nerve storm," directly due to the convulsions. The differential diagnosis can be established by ophthalmoscopic examination only. Stephenson reports a series of cases showing that an attack of meningitis or encephalitis may entail incomplete optic atrophy, nystagmus and paresis of one or more of the extrinsic muscles of the eyball. These symptoms may occur as isolated or as grouped phenomena.

P. H. F.

## ANOMALIES.

Probable Congenital Circumscribed Defect in the Chorioid with Anomalous Pigments and Vascular Arrangement.—Reber, Wendell, Philadelphia (*Ann. Ophthal.,* April. 1907). Illustrated by Dr. Mary Buchanan. The article does not lend itself well to abstract.

M. B.

A Case of Persistent Capsulo-Pupillary Membrane and Hyaloid Artery, with Atypical Development of the Vitreous.—Stephenson, Sydney, London (*Ophthalmoscope,* May.

1908). Girl of 15 with convergent squint, presented in the squinting eye a slightly undersized globe, with festoons running from the margin of pupil to anterior capsule of lens, thus occupying the lower two-thirds of the dilated pupil. There is also a persistent hyaloid artery, which does not contain blood and the retinal vessels are sheathed in opaque, white, glistening bands. V.= hand reflex.
M. B.

BLUE COLOR OF THE EYEBALL THROUGH THINNESS OF THE SCLERA AS CONGENITAL AND HEREDITARY ANOMALY.—PETERS, A., Rostock (*Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 1, 1908). Both eyeballs of a boy, aged 10 years, were equally grayish-blue over the whole sclera, a little more so around the cornea. There was no abnormal pigmentation, but above and below, on both sides, an embryotoxon 1.5 mm. wide. The fundus was normal, tension perhaps a little decreased but within physiological limits. Further inquiries revealed that the father and other members of the family, in all four generations, had the same anomaly, i. e., it was an instance of a typical heredity. This was confirmed by the fact that four persons had also a typical embryotoxon, a congenital anomaly, which may occur with and without a whole series of hereditary malformations.

With regard to the cause, diseases of the blood vessels or anomalies of pigmentation could be excluded, as the hair in the three cases examined by Peters was light blond. The sclera was either of normal thickness but abnormally translucent, or it was thinner than a normal sclera. It certainly had not affected the shape of the eyeball.
C. Z.

## BACTERIOLOGY.

ANATOMIC EXAMINATION OF A CASE OF STREPTOCOCCUS CONJUNCTIVITIS IN A NEWBORN.—WEIGELIN, S. (From the eye clinic in the University of Teubingen. *Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 1, 1908, p. 163). A child, aged 4 days, was brought to the clinic with the history that it had purulent discharge from the eyes for one or two days. The lids were swollen and very hard, the conjunctiva red and swollen with moderate purulent secretion, corneæ clear. The secretion contained numerous streptococci. The child died the next day.

The anatomic examination revealed an extended invasion of the conjunctiva by streptococci. Apparently the streptococci entered at the corneal margin and migrated in the subconjunctival tissue to the retrotarsal fold and the upper lid. In the lower lid they penetrated through intact and damaged epithelium and formed larger or smaller accumulations over the whole surface of the conjunctiva. As the eyeball and the other organs were perfectly intact it was a primary conjunctivitis, caused by streptococci, undoubtedly communicated during or after birth from the mother, who had suffered from a severe streptococcus infection but was cured with antistreptococcus serum.

Axenfeld emphasizes, in his bacteriology, that though streptococci rarely cause a primary conjunctivitis, not pseudomembranous, keratitis may be produced and that the simple primary conjunctivitis from streptococci is a great exception. The occurrence of a secondary affection of the conjunctiva in streptococcus sepsis has been observed by Leber, Wagermann and Axenfeld. C. Z.

Streptococcus Infection of the Eye in Scarlet Fever.—Dutoit, A., Burgdorf (Schweiz) (*Zeitschrift fuer Augenheilkunde,* 1908, xix, p. 341). The right eye of a boy, aged 16 months, was scalded by hot milk during the incubation period of scarlet fever, which broke out the next day. A violent conjunctivitis and ulceration of the cornea developed, terminating in total staphyloma. The secretions of the conjunctiva and cornea contained staphylococci in a few small heaps and an enormous quantity of streptococci. Dutoit assumes an ectogeneous artificial infection of the primarily injured eye with nasal mucus, which exclusively contained streptococci. C. Z.

## CASUISTICS.

To the Casuistics of Formations of Holes in the Macula Lutea (Retinitis Atrophicans Centralis, Kuhnt).—Noll, H. (From the eye clinic of Prof. C. Hess in the University of Wuerzburg. *Archiv. fuer Augenheilkunde,* lx, 1, 1908, p. 254). Kuhnt and Haab described in 1900 pathological changes at the center of the retina in form of a round hole and called it retinitis atrophicans, or traumatic holes of the macula. While Kuhnt thought of the possibility of senile changes from circulatory disturbances as the etiological factor, Haab considered the affection in most cases due to traumatism. Noll enumerates the incident literature and quotes the opinion of Murakami that two kinds of formation of holes must be distinguished, viz., spontaneous, like in his own and Pagenstecher and Genth's cases, and traumatic, as in the cases of Haab and one of Kuhnt. Reiss acknowledges both forms and attributes the holes to a local hydrops of the retinal center, which may be the consequence of congestion during and after birth, from paralysis of the blood vessels by contusion (traumatic form), vascular changes from Roentgen rays (Birch-Hirschfeld), or dyscrasic, owing to constitutional vascular changes, as arteriosclerosis, lues, nephritis.

The three cases of Noll furnish another proof that the formation of holes at the macula may be either spontaneous or traumatic.

The first occurred in a woman, aged 65, with V. = 6/lx, concentric contraction of the visual field, diminished central perception of colors, but no absolute scotoma. The only pathologic condition found in the patient was arteriosclerosis, especially of the arteries of the head, neck and limbs, which probably was the cause of the macular affection.

The second case occurred in both eyes of a boy, aged 14, affected with retinitis pigmentosa, and is the first case of typical formation of holes in that disease.

In the third case, a girl of 8 years, the development of the hole after traumatism and its disappearance and replacement by abundant pigmentation could be closely observed during a period of ten weeks. Four colored plates illustrate the various conditions.

C. Z.

## CATARACT.

One Hundred Consecutive Cases of Cataract Extraction.—Duncan, J. L., Pittsburg (*Arch. Ophth.*, May, 1908, xxxvii, 285), tabulates results obtained in a series of one hundred extractions and discusses the following points: 1. The best incision. 2. Simple or combined extraction. 3. Preliminary iridectomy. 4. Irrigation of the anterior chamber. In his series of cases the author employed two forms of corneal incision. He prefers the incision entirely in the periphery of the cornea except in cases where there are dangers of infection or where the vitality of the cornea is impaired, in which cases he makes a conjunctival flap incision. He did the combined extraction and believes the simple extraction subjects the patient to unnecessary risks. His objections to the simple extraction are greater risks of iris prolapse, greater difficulty in removing cortical matter, and greater chances of secondary glaucoma.

Duncan advocates preliminary iridectomy in all cases where there is a rigid iris, a tendency to rheumatism and glaucoma or with an immature cataract. He believes that iritis is less likely to develop and that there is less annoyance from iris hemorrhage, but advocates an iridectomy immediately preceding the capsulotomy in all cases where there are decided senile changes, when there is a possibility of infection, or when there is a chronic bronchitis or nasal catarrh. The author uses irrigation of the anterior chamber as a routine measure. W. R. M.

OPACIFICATION OF THE CORNEA FOLLOWING CATARACT EXTRACTION.—HULEN, Vard (*Jour. Amer. Med. Ass'n.*, July 25, 1908), reports a case of striped keratitis going on to general opacification, which could not have been due to any of the usual causes, as use of bichlorid of mercury, traumatism during operation, or bad general condition of the patient. The other eye had been operated on by combined extraction years before and showed a similar condition, the line of section being completely white and opaque, and the cornea rather thinly but entirely opaque with patches of greater density. The condition is extremely rare. Treatment is of no avail, and the causes are unknown. Where the condition has followed extraction in one eye it might be well to consider the danger of a similar operation on its fellow and have recourse to some other method, such as couching. In the discussion, attention was called to the fact that this condition may develop from striate keratitis, to the importance of traumatism due to a small section and consequent pressure in delivery, as an etiological factor, the rôle of strong antiseptics, such as bichlorid and carbolic acid, even in ointment form, and to the therapeutic value of dionin in the early stage of corneal opacification. P. H. F.

ON RECEDING OF THE FAR POINT IN INCIPIENT CORTICAL CATARACT.—MACHEK, PROFESSOR (*Zeitschrift fuer Augenheilkunde*, xix. 1908, p. 330), observed in a patient with myopia —3.00 after development of peripheral opacities of the lens a diminution of myopia to —1.00, in a case of hypermetropia + 1.00 an increase to +2, and in another case of myopia —0.75 a hypermetropia + 0.50. Besides these three cases which are reported in detail, he observed this decrease of refraction in some other cases of emmetropia and hypermetropia in incipient cortical cataract, and attributes it to a shrinking of the volume of the lens in consequence of the formation of cataract. According to Hess, the epithelia of the anterior capsule perish and lead to opacities of the cortical fibers, whence a preceding period of a more retarded formation of lens fibers may be inferred, which would explain a decrease of volume and weight of the lens. This correpsonds with the examination of Priestly Smith, who found that slightly opaque lenses weighed 0.20 grams, while normal lenses of individuals of the same age weighed

0.24. The diminution of refraction occurs only in the very first stages, while the advanced opacity, respectively beginning swelling, starts in with increased refraction.

On the other hand, the possibility of increase of the refractive index of the cortex must be considered, by which Heine explains the senile hypermetropia of the normal eye. A change of curvature of the lens from loss of water in the very first stages may also be possible. If from incipient cataract the far point is receding, the vision of an emmetropic or hypermetropic eye will be diminished, not exclusively by the opacities of the lens, but also by the decrease of refraction, so that the correction of it is of practical value in these cases. The observation of Ph. von Walthers, in 1874, that in certain cases the sight of the patient, previous to the opacity of the lens, may be of unusual brightness and acuity, must refer to cases of myopia in which vision was improved with the development of the first opacities of the cortex. C. Z.

THE EFFECT OF POTASSIUM IODID ON INCIPIENT CATARACT.—PFLUGK, Dresden (*Graefe's Arch.*, lxvii, h. 2, and lxvii, h. 3, January and February, 1908). The paper is divided into an anatomical and a clinical part and contains a thorough résumé of the literature. The following is a summary of his findings:

1. In rabbits the epithelial cells of the lens capsule overlying the interior sectorial lines differ in their anatomical structure as well as in their physiological function from the surrounding epithelium.

2. With the aid of the palladium chlorid reaction it is possible in rabbits, cats, dogs, guinea-pigs and frogs to determine the route of entrance into the lens of subconjunctival injections of solutions of salt. The reaction appears earliest and most markedly in the line of the anterior sectorial lines of the lens in the form of a sharp blackish streak. Later as the result of the penetration of the K. I. through osmosis it affects uniformly the anterior surface of the lens.

3. The first changes in the epithelium of the lens capsule takes place in naphthalinated rabbits in from one and a half to two hours after the administration of the emulsion. These changes are most pronounced over the sectorial lines.

4. By the simultaneous injection of weak solutions of K. I. these changes in epithelium of the rabbit's lens could be postponed several hours.

5. By the administration of the K. I. solution for several days

a decided limitation of the growth of the capsular epithelium in the naphthalin lens of the rabbit could be observed.

6. The acknowledged parallelism between naphthalin cataract of rabbits and human senile cataract makes it probable that the improvement of vision following the administration of preparations of K. I. (collyria, baths, subconjunctival injections) which has been observed by a long list of writers (Badel, Dufour, Etievant, Vaderau, Picquenard, Boisseuil, Dransart, Lafon, v. Pflugk) is the result of action upon the epithelium of the lens and its surroundings by the penetration of the K. I.

7. Reports of clearing up of well observed lenticular opacities are to be found in literature in large numbers in records free from criticism. Inasmuch as the possibility of clearing up of lenticular opacities with an accompanying improvement in vision is demonstrated, the doubt cast on the correctness of the observations of Badal and his pupils is not warranted.

8. A résumé of the published clinical histories of cases of incipient cataract in man treated by the iodid method shows that of the 239 eyes thus treated in a large number a very great improvement in vision occurred.

9. The length of observations in which the opacity was controlled in isolated cases of Badal was five years and in the 30 published cases of the author it was of varying length—as long as four years.

10. As the entire harmlessness of the treatment of Badal has been confirmed by an unusually large number of observed cases, the treatment of incipient cataract by the potassium iodid method is urged.

11. A review of the cases treated by the iodid method shows that a much greater improvement is to be obtained in the visual power by the subconjunctival injection than by instillations and baths, of equal strength solutions.

12. By the use of the author's method of anesthetizing the conjunctiva and the employment of acoin as an addition to the fluid to be injected as well as its use after the injection it is possible to render the subconjunctival injection of potassium iodid completely painless.

Badal employs as a collyrium a solution of K. I. (0.25 to 10.0) and as an eye bath (7.5 to 300.0) the latter in a gradually increasing concentration. While Badal gave up the subconjunctival method the author has found it by far the most efficacious and painless if employed as above directed in a 1 per cent. strength.

In very incipient cases 3 drops of a solution of 0.25 to 10.0 is instilled into the eye twice daily. More advanced cases are treated by eye baths of increasing concentration, 7.5 to 300 to 20 to 300, twice daily in an eye-cup two to five minutes. The solution is to be warm. As a guide to its employment the author says that after the visual acuity is improved the treatment must be kept up at least one month. If then, after a period of non-treatment, the opacity seems to have come to a standstill, the treatment is, after about three months, renewed in a milder form for a period of several weeks. If, in spite of this treatment, the opacities increase the subconjunctival injections are employed. W. Z.

PROPULSIVE HEMORRHAGE AFTER EXTRACTION.—BLOK, D. J. (*Tydschr. v. Gen.*, Jan. 26, 1907), saw Mrs. H. for the first time in 1896, after her family physician had treated her for glaucoma with atropin. The left eye had been operated on twenty years previously for glaucoma and her vision was 5/xv after correction; the media were clear, a small excavation of the disc and a small typical narrowing of the field were present. Tension normal. Eserin and a broad iridectomy had the usual good results in the right eye. After clearing of the cornea the retina showed many hemorrhages, which slowly disappeared; a typical excavation remained. Six days after the operation the wound opened again without any apparent cause; little pain in and around the eye, radiating to the nose, pointed to a recurrence of the glaucoma. However, the eye became quiet, but vision was reduced to motions of the hand eccentrically to the temporal side.

In 1903 the patient came back with cataracts in both eyes, which had progressed so far in 1905 that she wished to be operated upon. Urine normal; cornea normal; little arteriosclerosis. She was now 75 years old. Previously eserin was instilled, and before the operation 1 per cent. cocain with adrenalin three times. Tension was and remained normal; but directly after a normal section the cataractous lens presented itself and came out simultaneously, followed by vitreous. Direct removal of the speculum could not prevent the escape of the entirely normal vitreous, so that the eye was closed with a compressive bandage. Patient complained of great pain in and around the eye, the bandage was colored red and patient vomited. Ice was used over the eye and in the mouth. Pulse was tense, quite fast and slightly irregular. After an hour the pain disappeared, the bleeding stopped and the pulse slowly became normal. Four hours later changing the bandage a big coagulum mixed with viterous body protruded from the corneal wound. This being removed the wound closed. The bulb was then still full of blood. Tension not raised. The eye became atrophic, with total loss of vision.

Three weeks later, during the night, the patient became oppressed, coughed and expectorated a great deal of bright red blood. This was repeated five days later. The cause of these two hemoptyses was evidently the same as of the propulsive hemorrhage, i. e., rupture of arteries under the influence of increased heart action and increased arterial pressure. The increased heart action during the operation was probably due to nervous influence, perhaps anxiety as regards pain. It is not clear if the adrenalin had any influence for good or evil. However, Blok thinks it is better in such cases not to use it. The strong vessel tonus caused by adrenalin may favor the bursting of brittle vessel walls under existing or provoked higher arterial tension. E. E. B.

## CILIARY BODY.

THE DIAGNOSTIC VALUE OF TENDERNESS IN THE CILIARY REGION.—THOMPSON, EDGAR S., New York (*Am. Jour. of Surg.*, June, 1908). Excluding diseases of the cornea and the sclera, the writer mentions the following conditions which are accompanied by ciliary tenderness: 1. Cramp of the muscle fibers. 2. Hyperemia of the ciliary body. 3. Inflammation of the ciliary body.

Tenderness in cramp of the fibers has certainly not received the attention that it deserves, though it is probably frequently observed. It occurs whenever the muscle reacts from the strain of a refractive error, as in hypermetropia or the various forms of astigmatism. In certain cases of astigmatism the tenderness is in the meridian of contraction at first, though if the irritation be continued it ultimately extends to the entire muscle. Such patients have marked asthenopia, and almost invariably complain of great pain in the eyes, and also that their eyeballs are "tender" to the touch. He finds also the usual visual discrepancies, and perhaps other symptoms of the reflex group. It has seemed to me possible in a number of cases to identify the meridian of contraction, especially in the low degrees of hyperopic astigmatism, where the irritation has not continued for too long a period, and he has been able to observe in several instances a localized tenderness become general, throughout the muscle, where the patient would not submit to proper treatment. Of course, the full exhibition of atropin is the best, in fact, almost the only way to treat such cases.

The writer adds that such cases occur most frequently in the young, but may appear up to the inset of presbyopia; some of the severest cases occur between 40 and 48 years; the cramp may be produced by a relatively small local error. Whether cramp of the fibers ever leads to actual inflammation is a question on which a great variety of opinions are held.

Tenderness in hyperemia of the ciliary muscle occurs in a variety of conditions—keratitis of a certain severity, iritis, glaucoma, or a deep scleritis—in brief, any condition in which engorgement of the ciliary region reaches a certain height. It is, of course, always to be considered a grave symptom, and one which suggests the onset of a cyclitis; but cases with marked tenderness frequently recover without any other definite cyclitic symptoms. A considerable degree of ciliary hyperemia can exist without any tenderness whatever.

Regarding ciliary tenderness in inflammation of the ciliary body, the writer asserts that in cases of simple cyclitis there is frequently no tenderness whatever, while in certain chronic forms, associated with shrinking of the globe, the tenderness is very marked. It may be said in general that tenderness of a certain intensity is proof positive of the existence of cyclitis, while absence of tenderness excludes the acute forms, particularly in connection with other diseases, but does not by any means exclude the chronic form.

C. H. M.

## CIRCULATION.

EMBOLISM OF THE CENTRAL RETINAL ARTERY.—HESS, ROBERT. (From the eye clinic of Professor Dimmer in the University of Graz. *Zeitschrift fuer Augenheilkunde,* 1908, xix, p. 440). A woman, aged 54, suddenly lost the sight of her left eye ten minutes before she came to the clinic. The upper papillary artery and all its branches were attenuated, the blood column dark, interrupted at several places. Their reflex stripes, which normally are red and broad on the arteries, more narrow and white on the veins, were thinned, white, glaring and did not differ from those on the veins. Upon pressure on the globe the inferior, but not the superior, arteries next to the disc showed pulsation. No circulatory phenomena were noticeable in the affected vessels. At the visual test the patient was rejoiced to now count fingers at four m. excentrically. The center and whole lower half of the visual field were lacking.

Apparently there was at first total embolism of the central artery. The restored normal filling and circulation of the lower retinal arteries at the first examination proved that the embolus must have been conveyed into the upper branch, which after continued massage was discovered as a cylindrical white substance in the proximal end of the upper papillary artery. Under control of the mirror the eyeball was further massaged and with each refilling of the artery emptied by the pressure; upon relaxation of the pressure the foreign body advanced upwards until it was returned at the bifurcation of the vessel into its main branches. This is illustrated by a photograph with Dimmer's apparatus. Vision rose to 6/xxx. and central fixation was re-established. Then the patient herself performed massage for an hour and fell asleep. The next day V. was 0.8 and the visual field almost normal. The aspect of the fundus corresponded with this. The embolus was missing, the vessels normal and showed normal reflex stripes. At the upper temporal periphery a slight opacity of the retina was noticeable, indicating the place to which the fragments of the embolus had been carried. This is also represented by a photograph.

As the patient had a chronic heart trouble, the embolus most likely originated in the heart. Two months after the attack she reported that she had felt perfectly well and had no visual disturbances.

From the excellent result in this case Hesse advocates to make an attempt with massage as early as possible in cases of embolism. Through massage the propelling force can be repeated *ad libitum,* while the sudden decrease of pressure by puncture or iridectomy may give rise to an increased blood current in the arteries, but will be futile if the embolus does not move. He therefore attributes no importance to these operations in embolism. Seven cases of complete recovery are briefly cited from literature.

Hesse reports another case of obstruction of the superior temporal branch of the central artery, most likely due to embolism, although no source for an embolism was found. The assumption of a local disease of the arterial wall was not probable, as the otherwise healthy girl, aged 24 years, did not show any other affection of the vascular system. Since the visual disturbance had set in three days previously nothing could be expected of massage or operative measures and the treatment was confined to iodid of potash, under which the edema of the retina disappeared after a week. The different stages of the affection are illustrated by excellent photographs and the visual fields by charts. C. Z.

ON THE PROGNOSIS OF RETINAL HEMORRHAGES IN ARTERIOSCLEROSIS.—STRAUB, M., Amsterdam (*Klinische Monatsblaetter* *fuer Augenheilkunde,* xlvi, 1908, p. 517), pursued the fate of 15 cases of retinal hemorrhages from arteriosclerosis after five years. The hemorrhages were mostly attributed to thrombosis of the retinal veins. The ophthalmoscopic changes of the arteries and the further course proved the existence of arteriosclerosis. The disease of the veins is, according to the investigations of Harms, a consequence of general arteriosclerosis. although this may not be apparent clinically or cause general symptoms. Three of the cases were women. In five cases both eyes were affected. The hemorrhages occurred most frequently at the ages of from 45 to 65 years, viz.. 9, of which 5 had died from apoplexy, 2 after two years, 1 after three, 2 after two years, 1 aged 53, after three days. All cases belonged to the better classes, and had felt perfectly well, urine was free from albumin and sugar. The prognosis as to life was not bad in the youngest and oldest persons, while the affection of the retinal vessels at the intermediate ages gives a very bad prognosis.

Straub reports two cases, in each of which one eye had been removed on account of glaucoma. In the first case slight hemorrhages were observed in the second eye and an anti-glaucomatous treatment with pilocarpin was ordered. under which the hemorrhages, which had continued for two years, gradually ceased. In the second case the hemorrhages disappeared entirely one year after iridectomy. Straub thinks that the anti-glaucomatous therapy in these cases perhaps promoted healing. C. Z.

VENESECTION IN RELAPSING INTRAOCULAR HEMORRHAGES.—KYRIELEIS, DR., Hameln (*Klin. Montsb. fuer Augenheilk.*, xlvi, 1908, p. 513). The left eye of a healthy full blooded man, aged 19, without any other affections, especially of the circulatory apparatus, had gradually become totally blind from relapsing introocular hemorrhages and the right eye seemed to be doomed to the same fate. Kyrieleis therefore resorted to five venesections at intervals of from eight to ten days, drawing about 250 grams of blood each time, kept the patient in bed and gave him iodid of potassium. No new hemorrhage occurred within the next seven years. R. V. rose to 1/x and everything remained well for a year, when the patient returned with V = fingers at 1 m. after a sudden obstruction had set in, in consequence of a flat detachment of the right retina downward and inward. Although there was no recent hemorrhage, a venesection was performed and the patient was treated with pressure bandage, injections of salt solutions, cauterization of the sclera, according to Dor, and atropin. The retina was reattached after fifteen weeks, and fingers were counted at 2.5 m. A bluish gray membrane in the posterior portion of the vitreous was coursing horizontally over the disc, spreading in bands into the vitreous. At the surface of the membrane blood vessels could be discerned with + 10.00. The vitreous of the blind left eye was filled with gray masses and the whole retina was detached. The patient presented himself at intervals. Under iodid of potassium the bands became smaller.

Seven years later the vitreous was dotted with fine opacities, and a blood-red triangle could be seen, most likely a new hemorrhage. Although this caused no visual impairment, a venesection was made at once, drawing 250 grams of blood and a few days later the red triangle was partly absorbed.

Kyrieleis assumes a frail condition and permeability of the walls of the blood vessels and ascribes the hemorrhages to increased blood pressure from fluctuations at the time of puberty or menopause. Excepting cases of extreme anemia, hemophilia, senile cachexia, he recommends venesection in relapsing ocular hemorrhages, and, if not successful, as a last refuge the ligature of the common carotid, referring to the article of Vasquez-Barrière, reviewed in this number of OPHTHALMOLOGY.

According to Kyrieleis venesection has two advantages over the ligature: under aseptic precautions it is a perfectly harmless procedure and it may be repeated without damage as often as required. Venesection decreases the tension in the vascular system, but must be combined with long continued rest in bed, non-irritating diet. in order to exclude increased heart's action, and iodin internally.

C. Z.

ON LIGATURE OF THE COMMON CAROTID IN SEVERE CASES OF INTRAOCULAR HEMORRHAGE, WITH AN ANATOMO-PATHOLOGICAL CONTRIBUTION TO RETINITIS PROLIFERANS.—VASQUEZ-BARRIERE. A., Montevideo (Uruguay). (From the eye clinic of Prof. Th. Axenfeld in the University of Freiberg, i. Br. *Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 1908, p. 43). This almost always binocular affection is very rare, occurs in about 1 out of 5,000 eye patients, chiefly in men of from 20 to 30 years of age. The hemorrhages may recur very frequently, from eight to ten times within a few months, and may be completely absorbed; may, however, by destruction of the vitreous, detachment of the retina. retinitis proliferans, lead to complete blindness. So far the ligature of the common carotid had been performed in three such cases, by Mayweg, Axenfeld and G. S. Derby, Jr.

Vasquez-Barrière reports two cases, which were operated on by Professor Kraske of Freiburg, the first, a girl aged 24, in 1905. The right eye showed, in 1901, relapsing hemorrhages of the vitreous and retinitis proliferans and became blind. In 1903 it was enucleated by Professor Mellinger of Basel, on account of constant pain and increased tension.

The histologic description of the eyeball is given in detail. Besides the considerable changes on the inner side of the limitans externa, the most important were those of the blood vessels of the retina: hypertrophy and partial hyaline degeneration of the walls, perivasculitis, proliferation of the endothelium, thrombosis and obliteration.

At that time relapsing hemorrhages occurred in the left eye, which were not influenced by the extirpation of a goiter. Under inunctions of mercurial ointment, pilocarpin, iced applications, the vision, which had decreased to some 200ths, had improved transiently. When she came to the clinic, V. was 5/v. In spite of further treatment a relapse recurred, reducing V. to counting motion of head at 1/4 m., vitreous perfectly dark. Then the left common artery was ligated. Under continued treatment with inunctions, kal. iodidi, dionin, no relapse was observed. Twenty-six months after the operation: V. 6/xii, visual field normal, no floating opacities in vitreous, optic disc covered by a fine radiating white opacity (retinitis proliferans), borders and origin of blood vessels indistinct, periphery perfectly normal; retinal vessels could be seen to the finest branches.

At the apex of the heart a systolic murmur was heard, the second aortic sound was accentuated.

In the second case, a man aged 23, there was suspicion of aortic insufficiency. Hemorrhages occurred repeatedly in both eyes, leaving opacities and white preretinal pseudomembranes and most likely detachment of the retina. V. R. fingers at 2 m. V. L. 6/l. Blood pressure of the temporal artery with Basch's sphygmomanometer 90 mm. Hg. As blindness seemed imminent, the left common carotid was ligated. Six months later V. R. fingers at 3 m. V. L. 6/ix. The temporal half of the left disc was covered by a white ridge, ending downwards into a black mass (either detachment of the retina or old hemorrhages, or both), upwards into two horizontal branches which gradually disappeared in the red fundus, where numerous black spots were seen, but no fresh hemorrhages.

Relapsing hemorrhages into the vitreous are generally attributed to diseases of the blood, disturbances of circulation and local affections of the blood vessels. In Vasquez-Barrière's first case the alteration of the blood vessels had extended beyond the usual secondary changes in a detached retina, so that a special disease of the blood vessels was assumed as the cause of the hemorrhages.

The author then discusses the dangers of the ligature of the carotid, with especial reference to the elaborate paper of Siegrist on the subject, who found that the prognosis for all ages up to the sixtieth year is the same. The ligature of the common carotid artery is preferable to that of the internal carotid, as it excludes the anastomoses from the external carotid. The ligature most likely temporarily relieves the diseased walls of the vessels from the blood pressure and is only an adjuvant to the therapeutic measures, especially the administration of iodid of potash. Probably the unfavorable result in Derby's case was due to the early discontinuation of internal treatment.

Vasquez-Barrière formulates from his cases the following indications: In cases in which both eyes, or the only useful eye, are seriously damaged by relapsing intraocular hemorrhages, which by continuous recurrences threaten blindness, it is legitimate or even our duty to propose the ligature of the common carotid, if age and general condition of the patient do not forbid it, the more so because the risk of the operation is less than the danger of blindness, which may be prevented by it.

In a postscript Axenfeld reports another case of ligature of the common carotid, suffering from intraocular relapsing hemorrhages of both eyes for four months with reduction of vision to perception of light. The operation was so far well tolerated, and a report on the definite result will follow later. C. Z.

SEPTIC THROMBOSIS OF THE CAVERNOUS SINUS.—SIMPSON, W. L., Memphis (*Arch. Ophthal.*, July 1908, xxxvii, 379), gives the clinical history of a case of septic thrombosis of the cavernous sinus. Autopsy showed septic thrombi in both cavernous sinuses and the circular. Cultures showed staphylococci. The author gives the etiology, symptoms, diagnosis and treatment of cavernous sinus infection and believes that in his case an alveolo-dental periostitis or ostitis was the etiological factor. On account of the very unfavorable prognosis in these cases Simpson emphasizes the importance of the prophylactic treatment, such as early and thorough treatment of ulcers, etc., of the face, eye and nose; suppuration of the frontal, ethmoidal and sphenoidal sinuses; and thrombosis of the lateral and petrosal sinuses. W. R. M.

## CONJUNCTIVA.

Prophylaxis and Treatment of Gonorrheal Conjunctivitis.—Behrman, Michael, Covington, Ky. (The *Lancet-Clinic*, May 23, 1908), says that from 15 to 50 per cent. of blindness is said to be due to this disease. During the stage of infiltration he avoids all irritants, using argyrol. 25 per cent., saturated boric acid solution or 1-5000 bichlorid. Cold may be applied by compresses or by bags containing chopped ice, changing to hot applications if the cornea becomes infected. The bowels should be kept open. Incising the external canthus and the application of leeches to the temple are sometimes used. In the stage of discharge he used a 2 per cent. silver nitrate solution, applying it in the morning gently to the conjunctiva by means of cotton-wrapped tooth picks, following with a sodium chlorid solution. The frequency of cleansing the eye depends on the amount of discharge, from every fifteen minutes to three times a day. A dropper is used; syringes are condemned. A drop of a 25 per cent. solution arygrol is instilled after each irrigation. In the stage of hypertrophy, cauterization with the copper sulphate stick is used, after which the lids are touched with cotton to absorb the concentrated copper sulphate solution, and cold applications are then made. The alum stick may be used instead. M. D. S.

Proliferating Tarso-conjunctivitis: Histology; Statistics.—Gabrielides (*La Clinique Ophtalmoligique*, January 25, 1908). Spring catarrh, the author states, is a rare affection and its causes and effects have been but incompletely studied, as is also the case of its statistics. Histologic investigation has brought out new facts.

Gabrielides reports a case of which he made an histologic study, and that, with the statistics of twenty-three cases, he hopes to make a worthy contribution to the knowledge of the disease.

The case which Gabrielides reports was in a young man of 17 years, who had had conjunctivitis for eighteen months in both eyes. At first the bulbar conjunctiva was white; there was a white secretion at the angles of the eyes every morning which did not agglutinate the lids; no itching of eyelids, but there was relief from rubbing the eyes. Patient had consulted many specialists; protargol, copper sulphate, silver nitrate, sublimate and incisions were tried. During winter, conditions were not markedly ameliorated.

The case was first seen by Gabrielides Oct. 14, 1906. The lids were thick; the conjunctiva of the upper lids was covered with large serrated papillæ, occupying the whole surface of the upper tarsal conjunctiva exclusively, which, near the free border, were the size of a lentil; the conjunctiva of the lower lids was not normal, but thickened in portions, but without elevations of the epithelium. The vessels of the bulbar conjunctiva were enlarged and numerous, but did not pass over on the cornea, which latter membrane was intact; there was slight photophobia and a slight muco-purulent secretion. The left pre-auricular ganglion was swollen, but not painful; that of the right side was undiscoverable; several of the cervical lymph nodes were enlarged; the nasal mucous membrane was hypertrophied. The diagnosis of spring catarrh was made, but a tubercular coexistence was probable, though the bacillus of Koch was not found. A small piece of the conjunctiva, colored with eosin and Borel's solution exhibited numerous eosinic polynuclears. Mounted in Canada balsam the specimen demonstrated that the "tumeur printaniere" is constituted of the following elements:

Epithelial cells. These are large with an oval nucleus well stained throughout, but showing a more intense stain in the peripheric portion of the section. Some of the nuclei possess from one to three strongly colored chromatic granules. The nuclei are surrounded by an abundant protoplasm, which latter is limited by a cell membrane. The cells are circular, polyhedric or cylindric. The number of the epithelial layers vary from three to eight, lessening at the summit of the little tumors. The limits of the epithelial bed, are, as a rule, well defined, but in some portions indistinct. Cystic cavities exist which result from absorption of the epithelial cells. The connective tissue frame work is formed by proliferation of the conjunctival membrane, which is apparent throughout the tumors, especially at the base of the growths. Small round lymph cells were abundant, as were oval cells, resembling epithelium, which were scattered throughout the neoplasm. The epithelial cells, which in the specimen seemed to be scattered throughout, were the result of cutting across furrows of the conjunctiva. Many polymorphic cells with basophile granules were observed. The growths contained few blood vessels.

The author gives tables of blood counts. B. E. F.

CONTRIBUTION TO THE STUDY OF THE INFECTIVE CONJUNCTIVITIS OF PARINAUD (A CASE WITH CORNEAL LESIONS).—BASSERES and POUJOL (*Annales d'Oculistique,* March, 1908). A case is reported of typical Parinaud conjunctivitis in which there were serious corneal lesions. A kind of grayish granulation extended from the pericorneal vegetations, encroached upon the cornea and formed an elevated sessile vegetation the size of a lentil. Later a perforation occurred at this spot with anterior synechia and half of the cornea became opaque.

It has generally been supposed that the cornea is never involved in Parinaud conjunctivitis and the authors suggest the possibility of a superadded infection in this case. As corneal lesions, however, have been reported in three other cases, they think the statement that these are always absent in this disease should be modified.

G. C. H.

## CORNEA.

ZONULAR OPACITY OF THE CORNEA.—HEATH, F. C., Indianapolis (*Jour. Am. Med. Ass'n.,* July 18, 1908), discusses a condition variously described as calcareous film, band opacity (Graefe), or ribbon-shaped keratitis. It may be primary or occur in eyes blind from glaucoma or iridocyclitis. The opacities are punctiform and crowded together, forming a gray stripe across the cornea, occupying the exposed portion of the lid fissure. The disease progresses slowly. Sooner or later both eyes are involved. In some cases there are attacks of severe pain, but ulceration is never observed. Most cases were in men over 45. The pathological basis of the condition is a hyaline degeneration of corneal cells that later become calcareous. Gout, renal disorders, loss of vital energy in the cornea through vascular changes, repeated irritation of the surface of the eye, as by foreign bodies, are etiologic factors. Graefe noted a resemblance to glaucoma and bad effects of atropin. Sight has been improved by scraping the cornea and by iridectomy. Carbonate of soda, nitric acid, hydrochloric acid, 5 per cent., have been recommended. In Heath's case, scraping and applications of weak carbonate of soda solutions were of no avail. Iridectomy resulted in vision of 15 lx, where the patient had been unable to get about alone.

P. H. F.

MIGRATION OF INDIA INK IN A TATTOOED LEUCOMA.—STEINER, L., Surabaya, Japan (*Centralblatt fuer Augenheilkunde,* 1908, p. 104), previously described two cases in the *Centralblatt* of 1900. In the present case he was able to observe the process from beginning to end, and found that it was caused by an intercurrent inflammation. The white blood corpuscles migrated toward the inflammatory focus and carried with them the india ink from the remaining parts of the leucoma and deposited it there. C. Z.

CORNEAL CHANGE WITH IRIDOCYCLITIS.—CUPERUS, N. J. (*Tydschr. v. Gen.*, Jan. 26, 1907), illustrates with three histories that in iridocyclitis a streak-like opacity is found from the periphery progressing radially to the center at the posterior surface of the cornea. It is found over the entire cornea or locally and then at the place of the most pronounced pericorneal injection, where also the iris is swollen and the bulb sensitive to touch. The streak-like corneal opacity is seen for some days, in the lighter cases four to seven days; after one treatment of a patient with a fresh iritis with atropin, the subjective symptoms were ameliorated and the pericorneal injection objectively diminished, the aqueous humor became clearer, the swelling of the iris decreased; the posterior synechiæ, in benign cases, are loosened and a tendency to increase of pressure is present. This coincides with opacity of the vitreous body, which diminishes the vision. The prognosis of the streak-like opacity is favorable, it disappears in the lighter cases without a trace and improves in seven to ten days, which is sooner than in opacity of the vitreous body, contrary to the precipitates, which often leave vestiges, even if they do not disturb. As an analogue, is the sometimes radial, streak-like opacity of the cornea, which one finds surrounding an ulcus serpens corneæ, although this opacity is not so exclusively in the posterior corneal layers. The origin from the same mesoderm may account for the fact that affections of the uvea can be combined with affections of the corneal mesenchym.

Iritis and cyclitis are too sharply distinguished in the books. Cases of clinically pure iritis, even the lighter ones, with exception of the ciliary body, are rare or do not occur. In the beginning the symptoms of iritis are in the foreground, later, even with appropriate treatment, those of cyclitis intervene. The picture of pure cyclitis, however, is found where the inflammatory symptoms of the iris are totally or nearly absent. We should not speak of iritis glaucomatosa; in cases of iritis with higher tension, the ciliary body constantly participates and it is generally known that iridocyclitis is frequently accompanied by increase of tension. Atropin is always well tolerated when the patient can keep his bed.

E. E. B.

CONCERNING PERIPHERAL ECTASIA OF THE CORNEA (ATROPHY OF THE CORNEA.)—FLEISHER, Würtemburg (*Die Ophth. Kl.*, May 20 and June 5, 1908), adds six cases of this affection to the literature. In only one, however, was there a marked ectasia, but in two others the opacity was furrowed at its scleral border. The characteristic appearances were that in the cornea adjacent to the sclerocorneal, and merging gradually therewith was a more or less delicate opacification of varying breadth of ectasic or grooved zone separated from the center of the cornea by an irregular, wavy, more densely opaque line in which could be seen yellowish-white masses (fat. Seefelder). The line does not fade at its edges, but ends abruptly. The vascularization differs from that of peripheral inflammations of the cornea in that the marginal loops seem to be pushed toward the center and are composed of superficial and deep vessels. As in previously reported cases, most occurred in young people. The author does not consider the condition to be inflammatory. That the affection can, in its early stage, make a not inconsiderable progress was shown by the marked deterioration of vision in the course of two or three years traceable to the irregular astigmatism produced. W. Z.

SOME ETIOLOGIC FACTORS IN INTERSTITIAL KERATITIS.—RISLEY, S. D., Philadelphia (*Ophthalmic Record,* July, 1908). It is true that inherited syphilis is responsible for a large majority of the cases of interstitial keratitis, but we should bear in mind that a considerable group of affections which may be designated diseases of nutrition are frequently responsible for this form of corneal disease. Where inherited syphilis can be traced in the second and third generations it is often only one of the incidental manifestations of the faulty general metabolism. Two very interesting cases are reported, both of which had a very profound interstitial keratitis without specific history, or other specific manifestations. The general conditions were more those of myxedema; general torpor of mind and body; skin appearance of old ivory; general dropsical appearance, but with hardness of the flesh, without pitting, and no albuminuria: stubby clubbed fingers and stunted growth; dry skin, thick dry lips, swollen tongue and palate. No improvement in the ocular or physical condition was manifested until the administration was begun of the dried pulv. thyroid gland of the sheep, gr. iii. t. i. d. The local corneal improvement was astonishing, as was also the physical improvement. Recovery took place in each case, but in one there was some years later an attack of interstitial keratitis in the fellow eye which was not involved in the first attack. It occurred under quite different physical conditions, and the administration of the thyroid did no good. He recovered, however, under mercurial treatment. M. B.

## GLAUCOMA.

Chronic Glaucoma Simplex as the Next Higher Degree of Glaucomatous Disposition.—Kuschel, J., Lüdenscheid. (*Zeitschrift fuer Augenheilkunde,* xix, 1908, p. 426). The object of Kuschel's paper is to show that glaucomatous excavation of the optic nerve is produced by overextension. From anatomo-pathological dates he is satisfied that, in accordance with his static anatomic studies, the excavation of the lamina cribrosa and the atrophy of the optic fibers progress from the central vessels towards the borders, and that the superficial vessels, by coherence of their connective tissue with that of the disc, are passively drawn into the excavation. Therefore the condition of the small and thin vessels of the disc are of great importance for the early and special diagnosis of excavation of the optic nerve, whereas the bends of the large vessels indicate the higher degree and longer duration of the process.

Kuschel finds a further proof of the creation of excavation by over-extension in the glaucomatous halo. Inflammatory changes at the disc are considered accessory to senile sclerosis, which diminishes the power of resistance of the ocular static tissues and also of the lamina cribrosa. At the same time the tension of the intraocular current of fluids is increased, producing excavation of the lamina cribrosa. Thus the fibers, connecting the chorioid with the lamina, are stretched and lead to atrophy of the chorioidal ring. The nerve fibers, forming arches, are also stretched and become affected with anemic necrosis, which brings about an opacity of the otherwise translucent nerve fibers, creating the aspect of the halo. For further details we must refer to the original. C. Z.

Malignant Glaucoma After Iridectomy Cured by Posterior Sclerotomies, Observed for Ten Years.—Hegner, C. A. (From the eye clinic of Prof. C. Mellinger in the University of Basel, *Zeitschrift fuer Augenheilkunde,* 1908, xix, p. 552). During an attack of influenza the glaucomatous symptoms of a latent glaucoma of the right eye of a woman, aged 52, become so violent that, despite the swelling of the conjunctiva from catarrh, an iridectomy was performed. The eyeball remained hard and the anterior chamber was not restored. Vision was reduced to seeing motion of hand. By two posterior sclerotomies the tension was lowered, the anterior chamber restored, with considerable improvement of vision. These results were, however, transient. After closure of the scleral wound tension rose with rapid deterioration of vision. The anterior chamber was not entirely abolished, a cystoid scar formed at the scleral portion of the iridectomy wound. This combined with miotics, sufficed to diminish tension and improve vision to 2/vii, where it remained for eight months.

The patient returned after ten years, on account of pain in her blind left eye, and stated that ever since she had left she saw equally well with her right eye, without medication. Vision and visual field had remained the same as ascertained ten years previously. The rare opportunity to observe such a good result in malignant glaucoma which had no after treatment for ten years, was the incentive for the author to publish it, and to emphasize the value of posterior sclerotomy. C. Z.

CLINICAL DATES TO THE DEVELOPMENT OF GLAUCOMATOUS EXCAVATION.—SCHNABEL, W. J., Wein. (*Zeitschrift fuer Augenheilkunde,* 1908, xix, p. 335). Some time ago Schnabel published in the *Zeitschrift fuer Augenheilkunde* (reviewed in OPHTHALMOLOGY), his anatomical investigations on the origin and growth of glaucomatous excavation. Now he gives his clinical observations of this process, which has the same characteristics in three groups of eyes, types of each of which are described: 1. A case in which the papilla was replaced by a hole, while the intraocular tension was at the lower limit of physiological breadth. It thus belonged to the class termed by A. von Graefe amaurosis with excavation of the optic nerve.

In the second group acute glaucoma was cured by iridectomy, vision and tension were normal, but an excavation developed.

In the third and largest group the excavation formed while the intraocular pressure was pathologically increased. The formation of an excavation in an eye on which iridectomy had been performed for acute glaucoma, described by Schnabel in 1885, is here quoted: Up to the twelfth day after iridectomy, the dirty red opaque substance of nerve fibers around the large physiologic excavation had remained in the same state, which was noted before the operation. On the twelfth day a shallow dimple was seen in the nervous substance between lower border of the physiologic excavation and the margin of the disc. On the fourteenth day two new dimples had formed, which grew in the following days and became fused with the physiologic excavation. The nervous substance was consequently diminished in radial direction and the two main branches of the central artery displaced towards the medial margin of the disc. Eight days after the appearance of the first dimple the total excavation with steep walls was completed. Two days later the first signs of a halo appeared which was complete after two further days. During the development of the excavation the intraocular tension remained normal, the lamina cribrosa retained its original position, vision and extension of visual field rose.

The same process which here occurred rapidly does not take the same rapid course in all cases of the second group, and not in amaurosis with excavation of the optic nerve. In all groups it involves the section of the optic nerve, ensheathed by chorioid and retina, which consists of non-medullated fibers and lacks connective tissue. After previous redness and opacity of this part, one piece of it after the other disappears. A displacement of the lamina cribrosa or deepening of the bottom of the physiologic excavation can never be observed before or during the formation of the excavation. Although every total excavation, reaching to the margin of the disc and with steep walls, is glaucomatous, Schnabel emphasizes that those glaucomatous excavations which are most important for diagnosis frequently have not one of these qualities. For illustration he reports one of the many cases in which this was observed. The excavation was much smaller and more shallow than a physiologic excavation, but two small dimples were seen in the nervous substance. These excavations always depend upon a vanishing of a portion of the anterior piece of the optic nerve.

Schmidt-Rimpler considers the amaurosis with excavation of the optic nerve as common atrophy, with an unusual excavation which looks like a glaucomatous one. Schnabel, however, remarks that in amaurosis with excavation of the optic nerve there is not one sign of common atrophy present and not one sign of glaucomatous atrophy is missing. C. Z.

A Case of Glaucoma Treated by Lagrange's Operation of Sclerecto-Iridectomy.—Doyne, R. W., Oxford (*Ophthalmoscope*, June. 1908), reports the case of a man, aged 63, who had glaucoma simplex with R. V. = 6/lx and L. V. = light perception on temporal side. Both discs cupped and atrophic. Tension in left slightly plus. He was placed upon eserin for four months without improvement, when Lagrange's operation was performed. During the three months following the vision improved to 6/xxiv and the field increased materially. M. B.

Acute Glaucoma Caused by Eserin and Cured by Atropin.—Leplat (*La Clinique Ophtalmologique*, February 10, 1908). The author reports a case which he saw sixteen years ago and which he regrets he did not publish at the time. It was a single woman

63 years of age. Grief from the death of her brother precipitated an attack of glaucoma which the family physician successfully treated with instillation of atropia. Later Leplat was called to reduce the mydriasis and eserin was instilled with the result that in a few hours another attack of acute glaucoma followed. A small quantity of atropia salt was deposited in the inferior cul-de-sac with the effect of stopping the glaucomatous symptoms. Leplat saw the woman for many years, though she died afterwards quite blind. (Such observations are to be taken *cum grano salis.*—Editor).

B. E. F.

## GENERAL DISEASES AND THE EYE.

RELATION OF OCULAR AND CARDIO-VASCULAR DISEASE.—BLACK, M., Denver (*Jour. Am. Med. Ass'n.,* July 18, 1908). calls attention to the lack of subjective symptoms in many cases of serious cardio-vascular disease. and the importance of early recognition of the retinal changes. High arterial tension may threaten the integrity of the eye as well as life, and its reduction may preserve useful vision. General venous stasis is frequently present in cases of degenerative ocular changes. Most of the heart lesions are muscular, not valvular. Among the ocular diseases found were retinal hemorrhage, optic neuritis, asthenopia, conjunctival edema, neuroretinitis, and hemorrhagic glaucoma. P. H. F.

OCULAR COMPLICATIONS OF PREGNANCY.—WOODS, HIRAM, Baltimore (*Jour. Am. Med. Ass'n.,* July 18, 1908). Aside from temporary functional derangement, hysterical or neurotic manifestations, and general disturbance of metabolism with consecutive ocular disease, there are four important classes: uremic amaurosis, loss of central or peripheral vision without retinal lesion due to retrobulbar neuritis, albuminuric retinitis, and a specific form of neuro-retinitis with hemorrhage and exudate. There is doubt whether the term "uremic" should be applied to blindness occurring in eclampsia, as the element of acid intoxication may be due to faulty metabolism dependent on intestinal, hepatic or other disturbance. This also holds true of the renal origin of "albuminuric" retinitis in pregnancy. P. H. F.

PATHOGENY AND TREATMENT OF EXOPHTHALMIC GOITER.—ABADIE (*La Clinique Ophthalmologique,* April 10, 1908). in his paper, discusses the various etiologic theories of this condition and its treatment. An abstract of the paper could not do it justice and it is too long for a full translation. B. E. F.

LEPROSY IN ARGENTINA.—ROORDA SMIT, J. A. (*Tydschr. v. Gen.*, Feb. 23, 1907), estimates the number of lepers at about 1.000, statistics failing. He lived for more than twenty years in Cordoba. The author has been consulted for spontaneous luxation of the lens, which was one of the earliest symptoms of lepra. As early as 1896 he wrote ("Sur le mortalité," etc.): "I had to operate for spontaneous luxation of both lenses on a leper woman, 26 years of age. I could not detect in any of the eyes a change due to the leprosy with the exception of a very fluid condition of the vitreous body." This patient was seen in 1889 and again in 1896. In 1898 (a man 40 years old) and in 1899 (a man 42 years old) consulted him only for double lens-luxation. The last three patients were nose-scratchers and had had communication with lepers. No one wanted to be treated and would not believe that their eye disease was an initial symptom of leprosy. In 1904 two had well developed lepra tuberosa and the disease had also developed in the patient of 1896. This shows an intimate connection between leprosy and double spontaneous lens-luxation, which is probably due to a trophic disturbance, the expression of a mixed form of lepra tuberosa et nervosa. All showed thickening of the alæ naris.

In his 24 leper cases the fifth patient with eye symptoms was the following: A woman, 28 years old, came in 1899 with a leproma of the right eye, half in the sclera, half in the cornea; with atresia pupillæ after iritis. The left eye was normal, vision 5/vi. After iridectomy vision became 1/vi, fundus normal. The still inflamed leproma subconjunctivally was treated on two occasions by an injection of a saturated solution of iodoform and ether. After a pretty strong reaction the eye remained quiet until 1906, but showed only a tendency to the formation of a staphyloma. In 1902 a leproma developed in the left eye nearly symmetrically with that of the right eye, and patient came only when the pupil was already adherent to the lens. E. E. B.

ACUTE RETROBULBAR NEURITIS AND MULTIPLE SCLEROSIS.—FLEISCHER, B. (From the eye clinic of Prof. Schleich in the University of Tuebingen. *Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 1908, p. 113). Very frequently the etiology of acute retrobulbar neuritis remains unknown, as generally complete recovery takes place in a short time and nothing is heard of the further fate of the patients. Fleischer selected 30 cases of idiopathic acute retrobulbar neuritis, in which no plausible cause could be found, observed at the clinic, from 1881 on, and inquired by letter about their later conditions. If general disturbances were reported, the patients were ordered for examinations into the psychiatric and internal clinics. Their clinical histories are briefly given, from which it appears that almost all cases showed symptoms of multiple sclerosis, excluding those who had not been long enough under observation. In six cases other symptoms existed previously to the affection of the optic nerve, in some at the same time and in twelve they developed after the optic neuritis. Fleischer especially emphasizes that the first serious signs may set in a long time after the neuritis. Thirty-five per cent. occurred at ages under 21 years, 50 per cent. between the ages of 21 and 30, 18 per cent. between 31 and 40. In several cases of unilateral acute neuritis later examinations revealed also pallor of the other optic disc.

Then Fleischer discusses the cases of ophthalmoscopically marked optic neuritis and found in 5 out of 12 cases multiple sclerosis. These investigations show that acute retrobulbar neuritis is almost always a symptom of multiple sclerosis. About half of the cases of marked papillitis become affected with multiple sclerosis. Therefore in acute retrobulbar neuritis the diagnosis of incipient multiple sclerosis may be made with the greatest probability, if no plausible cause (as propagated inflammations, intoxications, etc.) can be ascertained. C. Z.

TABES AND SYPHILIS.—WERNICKE, OTTO, Buenos Aires (*Centralblatt fuer praktische Augenheilkunde,* 1908, p. 130), thinks it generally conceded that tabes is almost always a consequence of lues, but nowhere has he so far read that certain luetics remain almost always free from tabes. From his clinical observations he contends that leutics who had specific iritis do not acquire tabes. A similar relation exists between iritis and paresis, according to the investigations of Wintersteiner on 1,000 insane people, who found iritis only in 1.76 per cent. of paresis. According to Wintersteiner the explanation of this may be sought in the doctrine of blastoderms: A certain selection may take place so that in one series of cases the ectoderm (the proton of the cerebrospinal system with ocular vesicle) may be the starting point of the tertiary syphilitic affections, with exclusion of the mesoderm (vascular tunic of the eyes), while in another series it may be vice versa. C. Z.

DIFFUSE INTERSTITIAL KERATITIS IN ACQUIRED SYPHILIS.—DAVIS, A. E., New York (*Jour. Am. Med. Ass'n.,* July 25, 1908), reports a number of cases of this rare condition. Salmon patch is very exceptional. The course is generally quiter and milder than in inherited specific disease, but occasionally sight is entirely lost. In some cases reported there was inherited, as well as acquired, syphilis, the keratitis probably being due to the former. Herbert Fischer believes the affection to be a tertiary manifestation, that it seems usually to attack only one eye, the infiltration generally limiting itself to a portion of the cornea only. The clinical appearance is the same as the type found in inherited syphilis. The average time of development is about ten years after primary lesion. Stephenson, Nuel and many others consider this affection secondary to anterior uveitis, and that the unilateral character is due to early treatment. Neglected cases become bilateral. The disease has been produced experimentally in rabbits and monkeys by inoculating the cornea with scrapings from human chancre containing the spirochæte. Some cases are undoubtedly tubercular, yet they can not be distinguished from the specific variety, clinically or pathologically. In the discussion attention was called to the complication with mild plastic iritis, the rapid course in inherited syphilis, the presence of acquired syphilis in the very young where it may be mistaken for the inherited form, the tendency for the keratitis to assume a sclerosing form, the slight tendency to vascularization, the possibility of confirming the diagnosis by finding the spirochæte, and the question of Calmette's reaction. P. H. F.

## HISTORICAL.

A CONTRIBUTION TO THE HISTORY OF HYPEROPIA.—BLYSMA, Middleburg, Holland (*Woch. f. Therap. U. Hyg. des Aug.*, April 26, 1908), states that Gottheff Kästner, of Leipzig, in 1755 published a volume with the title of "Vollstandiger Lehrbegriff der Optik," in which he described the optical phenomena of H. under the name of "hyperpresbyopia," and that Hess, J. A., of Middleburg, in 1842 published a treatise entitled "Theoretical and Practical Manual of Mechanical Affection of the Eye, Vision, the Means by Which We See, the Physiological Functions of the Eye, the Properties and Errors of Glasses and the Art and Manner of Employing These in Mechanical Diseases of the Eye." In this work he classifies optical errors into Presbyta, Myopia Presbyopia (now Hypermetropia) and Presbymyopia. Under the term Presbyopia he gives a very accurate description of hypermetropia as a frequent congenital condition in which those affected with high degrees distinguish distant objects no better than nearby objects. He says that in contrast to the presbyopes and myopes the hypermetrope must wear their glasses constantly, as well for distant as near objects. W. Z.

## INJURIES.

Amblyopia and Complete Unilateral Paralysis of Third Pair Following Trauma of Eye.—Gaupillat and Regnault. (*La Clinique Ophtalmologique,* Feb. 25, 1908). The case reported by the writers was a young soldier at Saint Cyr, who was struck in the inner angle of the eye by a bayonet while fencing, making a very slight tearing of the conjunctiva. Patient was much depressed, fearing loss of sight; eye immovable; pupil dilated; accommodation absent; ophthalmoscopic examination negative; light perception only. All unfavorable symptoms passed away and the question arose as to whether hysteria was the factor to the symptoms.

B. E. F.

On Multiple Isolated Ruptures of Descemet's Membrane from Injuries During Birth.—Rupprecht, J. (From the eye clinic of Prof. Th. Axenfeld in the University of Freiburg. *i. B. Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 1908, p. 134). Isolated ruptures of Descemet's membrane have been described in various processes, which produce increase of intraocular tension or stretching of the eyeball, as hydrophthalmus, intraocular tumors, keratoconus, high myopia, peripheral ectasia of the cornea in gerontoxon, traumatism through the obstetrical forceps. Stock clinically assumed ruptures of Descemet's membrane in a newborn as a consequence of delivery with forceps. There was severe parenchymatous keratitis, which disappeared after two months, but typical keratoconus developed. Rupprecht saw a slight diffuse parenchymatous haziness of the cornea with impressions above the eye of a newborn, delivered with the forceps (narrow pelvis of the mother). Apparently the right blade of the forceps had been applied to the right eye. The child died the next day and Rupprecht gives a historic description with illustrations. Descemet's membrane presented two dehiscences, 1/3 and 2/3 mm. wide, and there were extensive hemorrhages between chorioid and sclera, and within and in front of the retina. The forceps apparently had pressed the cornea into the interior of the eye like a rubber ball, causing ruptures of the now convex inner surface of Descemet's membrane.

E. von Hippel found in the eye of a newborn small ruptures of Descemet's membrane and hemorrhages at the fovea and in the vitreous, which perhaps had also been produced by the forceps.

C. Z.

A Better Prognosis in Penetrating Wounds of the Eyeball.—Donovan, J., Butte (*Jour. Am. Med. Ass'n.,* July 25, 1908), makes a plea for the injured eye and claims that enucleation is performed too frequently and without sufficient deliberation. The fact that injuries of the eye are frequent in lower animals while sympathetic ophthalmia is unknown proves that many cases could be treated expectantly without danger. Many eyes are lost through meddlesome surgery. Donovan suggests the following routine:

1. Mild antiseptic cleansing with 1:5000 iodid, 1:2000 cyanid, or 1:5000 bichlorid of mercury or with saturated boric acid solution. Argyrol in special cases.

2. Remove all magnetic foreign bodies at once; also any that can be removed more easily and safely than later on. Those remaining to be removed from time to time when the eye can most safely stand interference.

3. Enucleate at once only such eyes as have been totally destroyed, waiting until fourth day to make sure. Others should be cleaned, filled with salt solution if collapsed; prolapsed iris replaced (? P. H. F.) or cut off.

4. Cauterize infected wounds; stitch when lids will not hold edges in apposition; atropin and dionin as indicated. Hot applications are always safe and usually preferable to cold.

5. Keep patient in bed a few days longer, if possible, as detachment of retina may have occurred. Finally, never interfere with an eye until you feel reasonably certain you are now doing the best thing, and at the best time; otherwise always wait. In the discussion attention was called to the danger of delaying enucleation in hopelessly injured eyes, the importance of early enucleation in preventing sympathetic inflammation, which is a disease limited to man, the possibility of its developing within a few hours after injury to the fellow eye. P. H. F.

EYE INJURIES DUE TO LIGHTNING FLASH.—HILBERT, Sensberg (*Die Wochensch. f. Therap. u. Hyg. d. Aug.*, Feb. 27, 1908), records two instances of injury to the eye from lightning flash occurring to two fellow telegraph workmen who, during a storm, sat by their instrument and were stricken by the lightning entering by the wires. Both were of middle age. The one was rendered unconscious for about ten minutes, and when seen by the author on the following day complained of headache, pain in the limbs, vomiting, of a blinding sensation and of lacrimation. Examination showed merely a mild catarrhal conjunctivitis. All of the symptoms except the pain in the limbs rapidly subsided.

In the second case, when the lightning entered the instrument the patient's entire visual field was filled with "fire;" this was followed by dilatation of the pupil, which was sluggish. There was haze of the cornea, ciliary injection and stony tension. Subjectively there was pain and halos. Under pilocarpin the condition subsided in the course of a few weeks. W. Z.

Copper Wire Within the Eye.—Weiss, K. E., Jr., Schw. Grúnnel (*Die Ophth. Kl.*, May 5, 1908). The patient was seen the day after the accident. There was a piece of copper wire 5 mm. long and 3 mm. thick in the anterior chamber. The wound had penetrated the iris and the anterior capsule of the lens. There was a localized opacity beneath both anterior and posterior capsule. A slight hypopion disappeared after the successful extraction of the foreign body. Vision later = 5/v, and the lenticular opacities were unchanged. According to the author the case teaches that the prognosis of copper injuries involving the anterior segment of the eye is not unfavorable, provided the metal contains no virulent germs and is removed early; that neither a mydriatic or myotic should be used, lest the position of the foreign body shift and be lost to view in the anterior chamber. For the same reason attempt at extraction without an anesthetic is dangerous. W. Z.

Bullet Wounds of the Orbit, and Its Surrounding Parts.—Williams, Edward R., Boston (*Ophthalmic Record*, June, 1908). Ten cases are reported. In three cases both eyes were wounded and complete blindness followed. In one case one eye only was injured and became blind. In four cases of non-penetrating wounds of one eye more or less complete blindness followed in that eye. In two cases wounding of one eye caused only temporary blindness.

M. B.

## INSTRUMENTS AND METHODS OF EXAMINATION.

Notes on Transillumination of the Eye.—Fridenberg, Percy, New York (*Arch. Ophthal.*, May, 1908, xxxvii, 302), uses transillumination as a routine measure in ophthalmic examinations. He prefers the Würdemann instrument, rather than the more intense illumination as given by the Sachs transilluminator, and states that an obstruction to light which is not very dense, as a small pigmented tumor, may cast a shadow with the Würdemann instrument, while a more intense light would mislead the examiner. He uses the Sachs light where a more intense illumination is needed, as in dense opacity of the media and in combination with ophthalmoscopic examination.

The author describes the appearance of the normal iris and the influence of the epithelial pigment layer of the iris on transillumination. He also describes the conditions as observed in opacities of the media and describes his method of examination by combining transillumination with ophthalmoscopy. He considers this method particularly valuable in examining the anterior portion of the fundus and applies the Sachs light to the sclera directly over the point to be examined and then, with the ophthalmoscope, obtains a clear picture further forward than can be done with the ophthalmoscope alone. W. R. M.

A SELENIUM PHOTOMETER.—(*Scientific American*, July 18, 1908). The inaccuracies of present photometric methods are enumerated. A photometer devised by William J. Hammer, a New York electrical engineer, is described. "In an electric circuit a selenium cell of approved construction is arranged through which a current is passed, the changes in the current, due to the action on the cell of the light selected for test, being indicated. The specific electric resistance of selenium varies over wide limits under the influence of light. In circuit with the cell and the source of current is included any desirable form of electrical measuring instrument." "A standard lamp of any desired construction, such as the Pentane lamp, is placed in proper position adjacent to the apparatus and lighted, being screened completely from the cell; a small current, preferably a small fraction of an ampere, is then caused to flow in the circuit including the cell, and after it has attained a steady value the fall of potential around the cell is measured by the volt-meter. After this the light of the standard lamp is allowed to fall upon the cell, and the change in the resistance of the circuit (as indicated by the change in the drop) caused by the action of the light upon the selenium is measured and recorded: this then becomes a 'constant' of the particular cell employed. After this, the light which is to be compared with the standard may have its specific effect upon the cell determined in the same way. Obviously the indications of the cell for the first specimens constructed must be calibrated by comparison with the results obtained by photometers, since the measurements of light now in use are purely arbitrary and have no relation to any definite physical quantity; but this relation having been once established in the manner indicated may be indefinitely perpetuated by periodic comparison of different cells to guard against change." The mechanism of the instrument is fully explained and illustrated by drawings.

M. D. S.

OBSERVATIONS WITH THE ORTHOSCOPE.—SCHOUTE, G. J. (*Tydschr. v. Gen.*, March 9. 1907), made Czermak's glass basin fit for experiments of longer duration by covering the glass margin with caoutchouc. When the basin filled with physiologic salt solution is placed before the eye the refraction of the cornea is annihilated, as the salt solution has nearly the same refractive index as the aqueous humor. Four strings keep it in contact with the head and it can be left on a whole evening; after some dropping the skin of the eyelids becomes edematous and the basin adheres by suction, so that it must be pulled from the face with some force. If the salt solution is not too cold, say about 40 degrees (Cent.), the eye tolerates this long continuous bathing well for a number of evenings. While the flat surface of the basin does not change parallel rays towards the cornea, and hardly changes the course of the rays, the refractive index of the lens is the only refractive force left in the eye. The loss of the cornea must be replaced by a positive lens. Every positive lens can be used, which by its location fulfills the condition f—d = constant (f = focal distance, d = distance of the lens to the cornea). However, some difference of observation is found with different lenses: the weaker the refraction of the lens is, the larger the retinal images.

The observer with the orthoscope looks at optotypes, which are vertical lines, alternating black and white, at a distance of 22 meters, for D. = 13, 33—8, 33—6—4—3—2—1, and 0.6 M. Positive lenses are put before the orthoscope until a sharp image is seen. This distance of the lens and the vision corresponding with this lens are recorded. A number of determinations are made with a set of lenses of + 1 to + 20 D. and the four observations are noted down, where the visual acuity was the best and the average of these four is taken as result. The distance of the weakest lenses appeared larger than their chief focal distances and were therefore surely faulty, as they were also very uncertain through the strong reduction of the visual field, they were not considered.

The distances between orthoscope and lens do not directly demonstrate the course of the rays in the eye; the rays go, with a strong lens just before the orthoscope, after being refracted through the glass, only a little through the air and then through the salt solution; with a far distant weak lens the distance through the air is long and surpasses many times the distance through the salt solution. To adjust the dissimilarity we make a reduction, which makes possible the representation, as if with all determinations the space between cornea and glass lens was entirely filled with the salt solution. Mathematical deduction shows, that $df = n_2xd'l$, or w. o. w.

The direction of the ray, going through the salt solution of the orthoscope, is the same as when the distance between orthoscope and lens should be as many times greater as the refraction index of the salt solution is, provided that this interspace is filled entirely with the salt solution, $n_2 = 1.3351$. In these 20 observations the difference between $f_2$ and the distance of the lens from the orthoscope averages 5.105 cm. The distance of the orthoscope to the cornea is 1.815 cm. (measured with the corneal microscope by Prof. Wertheim Salomonson). It may therefore be said that the rays come together 5.105 — 1.815 = 3.290 cm. behind the cornea.

As the refraction index of the salt solution and aqueous humor have not the same index (for the aqueous $n = 1.3365$) a small correction is necessary for finding the distance behind the cornea, where the rays unite. The radius of the cornea is 0.8179 measured by Zeeman with Helmholtz' ophthalmometer. We find $x = 3.2796$ cm.; so far behind the cornea parallel rays, refracted by cornea and aqueous humor, focus, w. o. w. $F_2$ of the cornea = 3.2796 cm., which corresponds with a refracting power of 30.49 D.

The same value, calculated directly from data for the eye without orthoscope, gives $F_2 = 3.2485$ cm., and the refracting power of the cornea 30.78 D.

For measuring the enlargement the observer with orthoscope and fixed head looks through a lens at objects at 22 meters. The other naked eye looks at a broad black line; the first looks through orthoscope and lens at a set of black lines and must try to find one which seems as broad as the line before the second eye, when they are covered. If the two lines are not exactly as broad, then a pancreatic telescope tube is put before the naked eye, which changes the size in small degree without making the image indistinct. Schoute used one with a negative ocular of 9 D., a positive center lens of 12 D. and a negative objective of 9 D.; these lenses were placed on a rhomb of Peaucellier with sides = 10.27 cm. and crossarms = 6 cm.; the negative lenses are 2.8 cm. inside the angles of the rhomb, the positive on the articulation of the crossarms. The negative lenses are simultaneously moved as regards the center lens, which movement produces a series of enlargements from 1 to 1.65 times with a motion of 5.5 cm., or with reversal of the tube of 1 to 0.606 times. The image in the one eye is measured with the image-size in the other eye, and the question is, if both eyes measure with same degree. The right eye is emmetropic, the left slightly astigmatic, myopic 0.75 D. in the meridian 20 degrees to the nasal side and hypermetropic 0.25 D. perpendicular to it. Does the left eye. which sees the objects pictured in another measure, accept another unity than the right one? To answer this question the astigmatic eye must receive a distinct picture without lenses, as these change the size of the image; this is done by putting before the emmetropic meridian a stenopaic slit and one looks at stripes, alternating black and white, perpendicular to the slit. A black stripe, 11 cm. long and 4 cm. broad, is put before the left eye and before the right eye a stripe, perpendicular to the first one, of the same broadness and with an intermission in the center of 4 cm. with margins perpendicular to the direction of the stripe itself. With prisms before the eyes the line before the left eye is made to fall over the intermission of the right line and to form a black cross. One of the lines can be moved fore and backward, which the observer does until it seems to him that the intermission is exactly filled by the black line. From the distance toward the eye, at which both stripes are, can be computed small differences both eyes make in estimating the size. The eyes are so, that the table and inferior border of the objects remain invisible: then the distance can not be valued monocularly; the broadness of the stripes alone determines. Of 70 such determinations, where the stripe before the right eye was at 180 cm. the result was that the other stripe was moved at the average at 180.1 cm.; the largest fault was 4.5 cm. too much forward and 4.25 cm. too much backward. The average fault, excepting the direction, was 1.621 cm. or 0.009 of the considered distance. His fault with binocular estimation, after Fechner and Volkmann, was among 80 determinations 0.01505 of the observed size. The fault made with the comparison of right and left eye comes between the limits of valuation of size and does not need special explanation.

When the stripe before the left eye was directed 70 degrees to the temporal side and the stripe with the intermission before the other eye perpendicular to it, the left stripe was moved without exception too far forward, out of 50 observations at an average distance of 173.34 cm., while the other one was at 180 cm. If dispersion should have remained in spite of the stenopaic slit the left stripe had to become broader and the fault smaller. The stripes are therefore placed always perpendicularly to the emmetropic meridian of the left eye during the determination with the orthoscope. While before the right eye a stripe 80 mm. broad was placed, the left eye could choose between stripes 40, 35, 30, 25, 15, 10, 7, 5, 5.25 and 3.5 mm.

broad. A set of positive lenses ranging from 20 to 2.5 D. was used. The enlargement with the orthoscope is proportionate with the first chief focal distance of the used lenses. The refracting power of the lens, which gives an enlargement 1, or w. o. w., which acts the same as the cornea, is like the quotient of the sum of the used chief focal distances divided by the sum of all determined enlargements. This computation states, that the enlargement, first, is given by a lens with $f_1 = 2.4521$ cm. Hereby the space between lens and ocular lens is considered filled with physiologic salt solution: corrected for the true cornea, behind which the aqueous humor with $n = 1.3365$, we find for the cornea $f_2 = 3.2634$ cm. and its refracting power 30.64 D. The computation from the enlargements touches as from the distances very nearly the value determined from out the anatomical data. The determination of the enlargements is much more difficult than of the distances: the first, however, are more trustworthy, because independent from the changes caused by the more or less swelling of the skin of the eye lids.

E. E. B.

A Wire Lid-Elevator for the Prevention of Loss of Vitreous Humor in the Operation for Extraction of Cataract.—Moraweck, Ernest, Louisville, Ky. (*Ophthalmic Record,* May, 1908). The elevator is 5⅜ inches long. The ocular end is formed into a wire loop bent on the flat to pass under the lid, the other end terminates in a wire ring through which the finger can be inserted in holding it. An elevator is used for the upper and the lower lids, and are held by an assistant, who pulls the lids well away from the globe.

M. B.

Method of Illuminating Test Type Charts with Artificial Light.—Black, Nelson M., Milwaukee (*Ophthalmic Record,* May, 1908). It is accepted that artificial light affords the best means of illumination. In order to determine the difference in opinion throughout the United States as to the efficiency of transmitted and reflected light, a letter was sent to the leading ophthalmologists. Many answers were received. The majority favored reflected light, but many of them had never tried transmitted light. The minority strongly favored transmitted light. The author favors transmitted light and submits a cabinet he has had made which is divided into compartments, the front surfaces of which are covered with porcelain plate upon which are the black letters, astigmatic dial, etc. Each compartment has an independent light which is operated by a switch from the test-case table. The cabinet is also fitted with a Williams lantern for color vision.

M. B.

## IRIS.

On Some Cases of Heterochromia of the Iris.—Lutz, Anton. (From the eye clinic of Prof. Dr. O. Haab in the University of Zürich. *Zeitschrift fuer Augenheilkunde*, 1908, xix, p. 208). After a review on the incident literature, Lutz reports in detail 23 cases. Seventeen of these showed other complications, six no diseases. The various features of this anomaly are discussed with the following résumé: The individuals whose one iris is lighter colored than the other are mostly brunette, and generally state that the color of one iris corresponds with that of the iris of the mother, the color of the other iris with that of the father. Very often the heterochromia was detected soon after birth, often it developed in later youth. The lighter color is produced either by non-formation of pigment or by loss of pigment. Very frequently the lighter colored eye, and only this, presents changes of two kinds, either isolated or combinated, viz., alterations in the innervation of the sympathetic nerve in the sense of chronic cyclitis with special tendency to formation of cataract. At first very fine deposits on the cornea and opacities of the vitreous are noticed. Then cataract generally develops and frequently secondary glaucoma ensues. The disease commences insidiously and becomes chronic, existing at least a few years. Both sexes are affected equally, generally during the second and third decennia. The disease is not painful. The ailments occur relatively late and consist in impairment or loss of sight. It is not hereditary, and so far constant relations to general diseases could not be ascertained. The etiology is not known. The anatomo-pathological investigations of Scherl suggest a lack of mesodermal pigment of iris and chorioid, those of Fuchs changes of the iris and external layers of the retina, probably due to chronic inflammations. The prognosis for life is good, for the eye dubious. Treatment can only be symptomatic. C. Z.

Remarks on Gonorrheal Iritis.—Beaumont, W. M., Bath (*Brit. Med. Jour.*, July 18, 1908), believes this condition to be much commoner than is generally supposed, while in acute rheumatism it is quite rare. In rheumatoid arthritis the connection is less clear, and it is an open question whether the relation is one of cause and effect or of simple coincidence. Gonorrheal iritis may complicate an acute attack of urethritis, but is more frequently a sequela, and may not come on until years after the original infection. Attacks of synovitis or of other forms of arthritis frequently accompany the ocular inflammation. Beaumont sees many of such cases, almost all in young adult males, at Bath, where syphilitic iritis is extremely rare. Sixteen of twenty of his cases "confessed to gonorrhea," and this seems to be a higher percentage than can be accounted for by other theories than cause and effect. (It is a question whether this percentage is any larger than that of gonorrhea in the community in general, where there is no iritis. Considering the great frequency of gonorrhea, it is safe to assume that the overwhelming majority of adult males has been infected at some time or other. To conclude from this that an attack of acute iritis is necessarily or even probably gonorrheal would be quite unwarranted. P. H. F). Beaumont gives an interesting historical sketch of the clinical study of iritis, noting that the rheumatic type was not recognized by John Hunter (died 1793), who even doubted the existence of specific syphilitic iritis, discovered, or rather rediscovered, by Schmidt in 1801. The term "iritis" was not used before the nineteenth century, and is barely mentioned by Frick (1826) and Scarpa (1818), the affection being considered as part or detail of a scleritis. Astley Cooper had doubts whether iritis was due to syphilis or to the mercury given to cure it. This doubt was definitely dispelled by Middlemore from whom "mercurial iritis" received its death blow. Gonorrheal iritis was recognized by Brodie in a case which was cured by repeated blood-lettings and mercury. The patient had had gonorrheal ophthalmia during the preceding summer. Mackenzie was well acquainted with the disease, and noted the frequent association of iritis with synovitis, after exposure to cold, or over-exertion of the eyes, even without a fresh attack of urethritis. Generally one eye only is affected and may suffer repeatedly. The other eye may become inflamed later, and the attacks alternate between the two. Rarely are both eyes inflamed at once. The long interval usually elapsing between the initial urethral infection and the onset of iritis, as well as the fact that these secondary symptoms, or more properly metastases of gonorrhea, are exceptional and hence unexpected, causes the true cause to be overlooked. The iritis may come on years after the urethral attack, and Higgens and Griffiths believe the iris "becomes on occasions an excretory organ, and tries to eliminate the poison, receiving considerable damage to itself in the attempt." The chronic, attenuated virus does not seem to be strong enough to set up inflammation in the "acclimated" or immunized urogenital tract. There must also be a personal element of idiosyncrasy in those who suffer, as the proportion of persons who have iritis to those who have had gonorrhea is very small indeed. P. H. F.

## LACRIMAL DISEASE.

Surgical Treatment of Epiphora.—Struycken, H. J. L. (*Tydschr. v. Gen.*, Jan. 26, 1907), advocates removal of the orbital lacrimal gland, when returning stenosis, ulcerative inflammation, etc., make radical opening of the nasolacrimal duct doubtful. Removal of the palpebral gland did not give the expected result; with sharp wind, and bent-over attitude, as in watchmakers or seamstresses, etc., the old complaints return. Galvanocaustic removal of the palpebral gland (Bettremieux, Chibret), tying of the efferent ducts of the orbital gland never resulted in a radical cure; on the contrary, the condition often became worse with a severe conjunctivitis. In the later years Struycken removed only the orbital gland when sounds did not improve, or when epiphora remained in some cases after removal of the lacrimal sac, or in facial palsy. Subcutaneous injection of one c. cm. of a 0.5 per cent. solution of alypin makes the skin anesthetic, then injection of one c. cm. under the fascia tarso-orbitalis and waiting five minutes so as to render the deeper parts anesthetic. After splitting the fascia the capillary hemorrhage stops quickly with adrenalin, while the smaller vessels are checked with forceps. With the careful luxation outward the gland remains painless and produces slight hemorrhage; the small arterial branch is tied. The fascia is only sutured in its superior part, no sutures of the skin, for its cicatrix will be just in the brow. Sometimes a deeper hemorrhage occurs (description of a case, where propulsion, even after tying of the art. lacrimalis arose; drainage and a soft compressive bandage. Next day the propulsion was much less, eyelids and bulbar conjunctiva, however, were filled with sanguineous fluid and the bulb nearly pitch black; after ten days all was normal. The hemorrhage was probably due to a tear of a small branch of the ophthalmic artery consequent to pulling at the gland. It is advisable to leave some of the lobe (tied) rather than to use force in pulling).

In some cases the epiphora was cured through evacuation in the antrum of Highmore (Laugier and Foltz). The first case was a patient who had her lacrimal sac removed for purulent dacriocystitis; recurrence occurred, due to suppuration of the frontal sinus, this pus went through the cellulæ lacrimales to the place of the lacrimal sac and then to the antrum, which also was filled with pus. After healing of these suppurations epiphora remained, and while a large opening had been made from the antrum to the nose, so that no fluid could stagnate, an opening toward the antrum with the gouge was made from the inner ocular corner after pushing aside the mucous membrane. Sinus maxillaris, nose and conjunctival sac were in open communication. A metal style was worn for some weeks and since then the drainage has been good. In another patient the opening had closed after a few months, but the epiphora had stopped, so that farther interference was unnecessary.

Also the old way of Celsus and Woolhouse was followed, i. e., making a connection with the second nasal passage; in this patient all ethmoidal cells were removed for suppuration, so that the distance between eye and middle passage was only 2.5 mm. The tears were well drained, but on account of returning kerato-conjunctivitis the opening had to be closed again. E. E. B.

A CASE OF UNILATERAL CONGENITAL FISTULA OF THE LACRIMAL SAC, WITH A REVIEW OF THE LITERATURE.—TYSON, HENRY, H., New York (*Arch. Ophthal.*, N. Y., July, 1908, xxxvii, 396), reviews the literature and reports a case of unilateral congenital lacrimal fistula. When the case came under his observation the child was 21 months old. There had never been any indication of inflammation of the eyes, eyelids, or sac. The author states that this is the youngest case of congenital lacrimal fistula reported, and the first one in which the fistula was noticed at birth. Tyson succeeded in closing the fistula with a single application of the galvanocautery. W. R. M.

DACRIOCYSTITIS DUE TO TYPHOBACILLI.—FOSTER, M. L., New York (*Arch. Ophthal.*, N. Y., July, 1908, xxxvii, 401), refers to a case of acute dacriocystitis occurring in a patient who had recovered from typhoid fever three weeks previously. Pure cultures of typhobacilli were made from the pus in the sac, and Foster believes that the purulent involvement of the lacrimal sac was due to the typhobacilli alone. W. R. M.

BLINDNESS FOLLOWING THE INJECTION OF PROTARGOL IN LACRIMAL SAC.—LEWIS, F. PARK, Buffalo (*Ophthalmic Record*, June, 1908). A woman of 50, who was suffering from an acute phlegmon of the sac which had ruptured on the face, was treated in the usual manner until inflammatory symptoms subsided somewhat when probing was begun and the passage syringed with 25 per cent. protargol. No reaction followed until this was done the second time. Two days later she phoned that great pain came on shortly after leaving the office and that the eye was blind. She was at once directed to return, when the eye was found proptosed from an orbital cellulitis. Pupil was dilated and immobile. No light perception.

The soreness and swelling gradually disappeared, leaving the eye blind from optic atrophy. It is presumed that the cellulitis was induced by some of the protargol escaping from the sac into the orbital tissues. M. B.

## LENS.

Treatment of Lens Displacement of Non-traumatic Origin.—Brose, L. D., Evansville (*Jour. Am. Med. Ass'n,* Aug. 8, 1908). considers: 1. Congenital lens displacement where treatment is sought either to improve existing vision or to avoid later intraocular disease. If correcting lenses are not sufficient we must consider iridectomy, discission. and extraction. A choice will depend on age, degree of displacement, size of lens and amount of vision obtainable. The point of election for iris excision is usually below, but the possibility of a future displacement of the lens downward must be borne in mind. 2. Lens ectopic, and cataractous as a result of intraocular disease. After the age of 25 extraction after preliminary iridectomy is advised. Discission is necessary in some, particularly the juvenile, cases, unless there is danger of exciting intraocular inflammation. 3. Congenital displacement complicated with acute glaucoma. The family history may disclose this tendency. Discission is proper under 25, when vision is insufficient, but technically difficult on account of the movable lens. Extraction is best in patients over 35, and where iridectomy is inadvisable. 4. Displacement due to acute glaucoma. These cases require extraction preceded by or combined with iridectomy. Prognosis must be guarded, and the possibility of intraocular hemorrhage considered. In case of tension persisting after iridectomy, sclerotomy may be done before attempting extraction of the cataractous lens. P. H. F.

## LIDS.

The Treatment of Trichiasis.—Butler, T. Harrison (*Arch. Ophthal.,* N. Y., July, 1908, xxxvii, 388), as a result of a large experience with trichiasis cases at the British Ophthalmic Hospital in Jerusalem, considers the Van Millingen operation the only satisfactory splitting operation. He considers it especially indicated where there is conjunctival atrophy, where the tarsus is short, and in relapses from other operations. The author has never seen a recurrence from Van Millingen's operation. He gives the technic of the operation. W. R. M.

The Relief of Ptosis.—Fergus, A. Freeland, Glasgow (*Brit. Med. Jour.,* May 16, 1908). The writer divides the possible operations into several classes: 1. Those which, like the procedures of Drausart, Pagenstecher and Hess, depended upon the production of cicatricial contraction. 2. Procedures which left ligatures permanently embedded in the tissues, as in the operations of Mules, Worth and Harman. 3. Attempts at the advancement of the occipito-frontalis, such as the author had previously described, or attaching the superior rectus to the upper lid; others had advanced what they believed to be the levator palpebræ superioris. 4. Plastic operations, such as that described by Panas. He greatly objects to the unsurgical method of those operations which depend upon cicatricial contraction with sutures, for unless they become septic they are useless. He prefers the advancement operations. Recently he has had marked success by a new method, which consists of shortening, rather than excision, of a large portion of the tarsus. A portion of skin and tarsus was removed between two incisions in the lid, and the strong fibrous tissue which comes down from the occipito-frontalis was attached to the portion of the tarsus remaining with absorbent sutures. The skin was then closed with superficial sutures. He showed several photographs of patients who had been treated with this method with excellent results.

C. H. M.

## MATERIA MEDICA AND THERAPEUTICS.

A Case of Gonococcal Conjunctivitis Treated After the Method of C. Adam (Berlin).—Scheuermann, Stuttgart (Die *Ophth. Kl.*, May 5, 1908). The patient was 8 months of age, and when first seen the affection was monolateral. Under treatment with sublimate solution the condition not improving, and the other eye having become infected, Bleno-Leincet salve and euvaselin were employed with the result that a very rapid improvement took place.

W. Z.

Use of Sophol in Disease of the Eye.—Bock, Laibach (*Woch. f. Therap. u. Hyg. des Aug.*, May 7, 1908). Sophol is the trade mark given a combination of silver with formaldehyde-nucleic acid, containing 22 per cent. of silver. It was employed by the author usually in a 5 per cent. aqueous solution. It was found to be especially valuable in ophthalmia neonatorum and of service in all affections of the conjunctiva accompanied by profuse discharge. It is a mild, non-irritating bactericide. Its action is superficial.

W. Z.

Proof of the Deep Action of Dionin.—v. Arlt, Vienna (*Die Wochensch. f. Therap. u. Hyg. d. Aug.*, March 19, 1908). A man

48 years of age noted that the sight of his only useful eye was failing. Ten days later the author made an examination which showed a myopia of 5 D., V. = 5/viii, an oval hemorrhage near the macula with a corresponding scotoma. Color sense (Westinghouse metal filament lamp) showed diminution of one-half for green alone. No change having occurred in eight days, 0.005 grm. of dionin was placed in the conjunctival sac. In three minutes there was marked lymphatic engorgement which had reached its height in ten minutes. Five minutes later the patient remarked that the spot before the eye was smaller and fainter. V. = 5/vi pt. Next day V. = 5/iv pt. The hemorrhage, the difference in color sense and the scotoma had entirely disappeared. About one month later the patient returned with episcleritis but the visual functions were normal.

The author has no scruples against crediting the dionin with the result, as he states that he followed the case before, during and after the employment of a single therapeutic measure.

W. Z.

ON THE IMPORTANCE OF OPSONINS FOR THE EYE.—ZUR NEDDEN, PROF. (From the eye clinic of Prof. H. Kuhnt in the University of Bonn. *Zeitschrift fuer Augenheilkunde,* 1908, xix, p. 314). The opsonins are, according to their discoverer Wright, substances which occur in the normal blood of man and have the faculty to influence bacteria so that they are eaten by the polynuclear leukocytes. The object of the experiments of zur Nedden was to answer the cardinal question: Whether the opsonins of the blood of non-immunized men and animals enter into the secretions of the conjunctiva and the avascular parts of the eye (cornea, aqueous, lens, vitreous), and, if so, under which conditions. He chiefly tested bacteria, pathogenic for the eye, viz., diplobacillus Morax-Axenfeld, staphylococcus albus, streptococcus, pneumococcus, and bacillus of dysentry.

His results were: The opsonins, under normal conditions, are not found in the secretions of the conjunctiva and the avascular parts of the eye. In inflammations of the conjunctiva its secretions contain opsonins, but not the lacrimal fluid. No opsonins were ascertained in the secretion of chronic dacryocystoblennorrhea. The opsonins enter the inflamed cornea after the anterior chamber is opened, as observed in serpent ulcer after keratomy. After corneal puncture of a non-irritated eye the opsonins were present in the reaccumulated, so-called second, aqueous. Inflammation of the cornea, anterior chamber and vitreous, and subconjunctival injections of concentrated salt solutions, but not passive congestion, favor the transmission of opsonins into the anterior chamber. After repeated punctures of the vitreous, the latter contains opsonins, which disappear after a few days. Inflammations of the vitreous itself, not of the anterior parts of the eye, nor subconjunctival injections or passive congestion, promote the entrance of opsonins into the vitreous. In the lens opsonins were never ascertained, even in the most violent inflammations of its immediate surroundings. The leucocytes of fresh, thin gonorrheic conjunctival secretions are well adapted, for the proof of phagocytosis, from the vitreous, and the necrotic coatings of the cornea are generally to much degenerated to take up micro-organisms.

zur Nedden believes that the transmission of opsonins into the conjunctival secretion and the avascular parts of the eye takes place according to definite laws, the importance of which for the healing process of infections diseases of the eye can not very well be denied.

C. Z.

To the Question of Healing Trachoma with Becquerel Rays (Radium).—Selenkowsky, J. W. (From the eye clinic of the Imperial medico-military academy at St. Petersburg. *Archiv. fuer Augenheilkunde,* lx, 1, 1908, p. 63), discusses the biological properties of radium, its action on the eye and his therapeutic results on 114 trachomatous eyes, with the following conclusions: The radiation of the conjunctiva of everted lids with a maximum of 0.01 radium bromid during a maximum of ten minutes is absolutely harmless. Radium is a very effectual remedy in the treatment of granular trachoma: the granules disappear without cicatrization, without pathologic changes of the mucous membrane and without relapses. It surpasses the mechanical and medicinal methods in effect and duration of treatment. One sitting of ten minutes has more effect than two of five minutes each. The first result is noticed after from two to three sittings. In the commencing cicatricial stage of chronic trachoma, complicated with pannus, radium is less efficient than in the merely granular form, but removes the remaining granules and the general infiltration in a short time, with improvement of pannus. Dependent on individual elements, it is here more or less powerful than the common remedies. As radiation may produce irritations of the mucous membrane in this kind of trachoma, it must be applied less frequently, prolonging the time of treatment. In patients who have been unsuccessfully treated for years with the ordinary means, favorable results from radium may be obtained within from one to three months. Radium greatly relieves pain, especially in acute pannus. Its action being cumulative, the sittings must not be repeated more than once or twice a week. After disappearance of the granules and the infiltration one or two more sittings must be given. The remaining swelling of the mucous membrane disappears without treatment. For persistent catarrhal symptoms astringents are indicated. Only radium of great activity must be employed. If this is not known, it ought to be tested on the normal skin or on the eye of the rabbit. Selenkowsky recommends the radium bromid of Buchler in Braunschweig, Germany. It is better to keep the radium in a glass tube, shaped according to the forms of the eyelids with a sufficiently large surface for better transmittance of the rays. The glass tube must directly touch the mucous membrane. Selenkowsky warns against immediate application of radium on the eyeball, on account of its deleterious action on the cornea and the inner parts of the globe. The symptoms of irritation and necrosis of the epithelium of the mucous membrane, now and then observed after frequent sittings, have no bad effect on the mucous membrane. In most cases, if radium is applied cautiously, no such symptoms are encountered. On account of its painlessness, the radium therapy is especially indicated in children and timid and nervous patients. In no case can radium be considered as a panacea in the treatment of trachoma. Selenkowsky is far from asserting that relapses are entirely excluded. It is probable that radium will prove, not as an exclusive means, but as an adjuvant to the ordinary methods of treatment of trachoma. From his experience and observations Selenkowsky recommends to further investigate the action of Becquerel's rays on trachoma. The literature pro and con is amply utilized. C. Z.

REMARKS ON THE TREATMENT OF AFFECTIONS OF THE CONJUNCTIVA AND CORNEA WITH JEQUIRITOL.—COSMETTATOS (*La Clinique Ophtalmologique*, Feb. 10, 1908). Jequirity as a medicament was introduced by De Wecker. It produces, as well known, a special conjunctivitis—jequirity ophthalmia, and is characterized by an injection of the conjunctiva, which becomes intense, and finally inflammation and purulent secretion with edema of the lids and enlargement of the pre-auricular lymph node and also rise of body temperature occur. In eight or ten days this all disappears. Jequirity was first employed especially in chronic trachoma with pannus, and it is in that the best results are had, because as part of the inflammation there supervenes a serous infiltration of the cornea, which favors a removal of the corneal opacities. But the difference in the strength of the solutions has made a difference in the effect and in some cases serious results have followed, and with many the use of the drug has been abandoned.

During late years there has been much investigation as to the active principle of the jequirity, which was found to be abrin. Some authors consider this to be an alkaloid, while others look upon it as a bacillus. Max Brieger proved it to belong to the toxalbuminoses. The most interesting part of the researches with abrin have shown that the conjunctiva, having already suffered from jequirity, becomes immune to a second inflammation. Erhlich has proved that animals which are given more or less strong doses of abrin, preserve immunity in both eyes from the drug. In France Calmette and Dalard studied the immunity produced by abrin: and Lapersonne applied the abrin antitoxic serum in man. Römer in Germany made a special preparation by means of abrin which he calls jequiritol and gives the directions for its use. Thus he regulates the dose of abrin and produces a serum from immune animals—the jequiritol serum, which has the power of annuling the jequirity inflammation.

The jequiritol made by Merck, under Römer's direction, constitutes four solutions numbering one, two, three and four. One drop of solution No. 2 is ten times stronger than No. 1, and so on.

At the clinic of Professor Hess at Wurzburg, the first application of this therapy was made and found satisfactory.

Cosmettatos in applying the remedy begins with solution No. 2, and ends with Nos. 3 and 4, using from one to four drops. Generally during the use of No. 3 the inflammation is produced. Once the full effect is procured the remedy is stopped. If the inflammation is insufficient the procedure is begun again. Only once has Cosmettatos had to use the antiserum where the inflammation and pain had become excessive: its effects were had at once and the inflammation disappeared in a few hours. Cosmettatos reports twelve cases in which jequiritol was used. B. E. F.

THE DANGERS OF THE OPHTHALMO-REACTION.—TROUSSEAU (*La Clinique Ophtalmologique*, Jan. 25, 1908). The active introduction and general use of the ophthalmo-reaction have caused the author to point out the dangers of this tubercular test. The facts accumulate which show that the measure is not free from risk Ordinarily the reaction appears in from five to eight hours, and between twelve and twenty hours its maximum is reached; after that time a recession should take place. If the reaction is very violent it may last several days. Trousseau relates a case of a child of 7 years that prior to an attack of measles had had excellent health. Following the measles the child had phlyctenular conjunctivitis, for which yellow ointment was applied. Last November a slight bronchitis appeared and the parents wished the test of the ophthalmo-reactions made, the application of which was followed by a severe swelling of the lids with abundant secretion. Twenty-one days afterward the child was brought to Trousseau, and the removal of the conjunctival condition required active treatment for some time. The author believes the trouble to have been caused by the tuberculin.

At the Paris Ophthalmological Society (Oct. 8, 1907), Kalt reported a more serious case in a man of 46, who had had, since the April preceding, an attack of iridochorioiditis of right eye and sclerokeratitis of left, following the instillation of a 1 per cent. tuberculin.

Trousseau reports other cases which were under his care.

B. E. F.

DOES THE OPHTHALMO-REACTION PRESENT SOME DANGERS?—BRUNETIERE (*La Clinique Ophtalmologique,* Jan. 25, 1908). Bearing on this question, Lapersonne published in the *Presse Medicale* a study in the course of which he considered the injurious effects imputed to the Calmette procedure and stated that the dangers were insignificant and that the positive oculo-reactions which have been obtained were considerable in number. Brunetiere remarks that for two months past there had been many oculists who objected to the new method. Kalt reported a case in which he attributed aggravation of tubercular intraocular lesions to the ophthalmo-reaction. Morax believed in that case the aggravation was a coincidence. Brunetiere is of the opinion that the cases in which complications arise are few. He reports a case of phlyctenular conjunctivitis in which the ophthalmo-reaction apparently gave threatening symptoms, which subsided later, however.

B. E. F.

IS CALMETTE'S OPHTHALMO-REACTION FREE FROM DANGER?—THOMPSON, ERNEST, Glasgow (*Ophthalmoscope,* July, 1908). Constitutional reaction has been reported by several observers. Tuberculin causes movements of the tuberculo-opsonic index similar to those which follow a subcutaneous injection. Napier reports two cases where tuberculin was administered subcutaneously after use of the Calmette's test, and in each case a severe conjunctivitis came on some weeks later in the eyes to which only the test had been applied. The inference made is that the ocular test causes a local change of some kind which responds sharply to the introduction of tuberculin into the circulation. The local reaction on diseased eyes is generally considered to be dangerous. Many cases have been reported where the eyes had been permanently damaged. Very severe conjunctivitis, lasting many weeks, has been reported by a number of observers. Phlyctenular keratitis has followed in a few cases. Where one eye is healthy and the other diseased, especially with a keratitis of doubtful tubercular character, the application of the test to the apparently healthy eye is fraught with danger. Knapp reports such a case. W. B.

Sero-diagnosis of Syphilis in Ophthalmology.—Cohen. (From the eye clinic of Prof. W. Uhthoff in the University of Breslau. *Berl. Klinische Wochenschrift,* 1908, No. 19, p. 877). The serum reaction of Wassermann, Bruck and Neisser was tested on 64 eye patients. These were grouped in positively syphilitic, doubtfully syphilitic and suspected of syphilis. In 23 cases the reaction was positive, 8 of these being positively syphilitic, 6 of which had iritis. Out of 41 cases with negative reactions 5 had clinically been diagnosed as syphilitic. In the remaining 36 there was, besides the eye affection, no other sign of syphilis. The cases are arranged in tabular form, some are reported in greater detail. Cohen reached the following conclusions: Wassermann's reaction in ophthalmology, if negative, gives certain diagnostic hints. If positive, it may be decisive for diagnosis and treatment.
C. Z.

Does the Serum Therapy of Diphtheria Lessen the Number of Cases of Postdiphtheritic Paralysis?—Bylsma, Middelburg (*Wochensch. f. Therap. u. Hyg. d.,* March 19, 1908), states that in the past ten years he has treated forty-six children in whom he had diagnosed postdiphtheritic paralysis of accommodation, but that in that same period he had not seen a case of paralysis of accommodation in diphtheria where the patient had been treated with serum. W. Z.

Subconjunctival Aseptic Abscess for the Cure of Ulcer Serpens Corneæ.—Ferentinos, Patras, Greece (*Die Ophth. Kl.,* March 5, 1908), fell upon this method accidentally in using his preparation of iodid of mercury 1:2000 in liquid vaselin 1:2, subconjunctivally in a case of hypopion ulcer of the cornea. After the injection an abscess formed which proved to be sterile and the ulcer healed. He has found that it is not safe to use more than two divisions of a Pravaz syringe of the oil, as in larger doses it may cause pain and exophthalmos. Rarely the injection is repeated after a few days. The subconjunctival abscess is not to be evacuated. The author believes that the production of a sterile abscess will prove of value in affections of the eye other than ulcus serpens. W. Z.

SEROTHERAPY (ANTIDIPHTHERITIC SERUM) IN SEVERE INFECTIONS OF THE EYE.—TEULIERES, Bordeaux (*Die Ophth. Kl.*, April 20, 1908), has employed this serum in eye affections of an infective nature, especially in hypopion keratitis. He has found that it is a curative agent; often, however, only a useful adjuvant to the usual methods employed in these conditions. It should be used subcutaneously in dose of 10 to 20 c.cm. and as soon after infection as possible. It may be employed as a prophylactic measure. His results show that it ameliorates the pain, checks the progress of the infection and favors the absorption of the infiltrate and exudate and the formation of newformed tissue. W. Z.

A NOTE ON ANTISTAPHYLOCOCCIC VACCINE.—MADDOX, E. E., Bournemouth, Eng. (*Ophthalmoscope*, June, 1908), reports the case of a man of 78 years who was operated upon for cataract. On the third day he developed acute gout, with eczema of forehead and scalp. By the next day there were evidences of wound infection, which went from bad to worse until the eye seemed lost, notwithstanding active cauterization of the infected wound and the administration of polyvalent antistreptococcic serum. Wright's antistreptococcic vaccine (S. aureus) was then injected with immediate improvement, terminating in resolution with V = 7/xii.
W. B.

INJECTION OF ALCOHOL IN BLEPHAROSPASM.—VALUDE (*Annales d'Oculistique,* April, 1908), reports three more cases successfully treated by this method, to which attention has been several times called in these abstracts. He infers from the result in one of these cases that the injection of alcohol is applicable not only to simple blepharospasm, but to so-called tic douleureux. G. C. H.

THE THEURAPEUTIC VALUE OF SUBCONJUNCTIVAL INJECTIONS OF STERILIZED AIR.—FRENKEL (*Annales d'Oculistique,* March, 1908). Koster first maintained the utility of the introduction of sterilized air beneath the conjunctiva or into the anterior chamber in the treatment of tuberculosis of the cornea and iris, and Terson extended its use to the treatment of various affections of the anterior segment of the eye not necessarily of a tuberculous nature.

Frenkel has experimented with a large number of cases to determine the value of this mode of treatment and has reached the following conclusions: Subconjunctival injections of sterilized air may at least be considered entirely harmless. As a rule, it is the affections of the anterior segment of the eye that are influenced by this treatment. Among these affections, those of the cornea and episcleral region are proper for subconjunctival injections, while for the affections of the iris and ciliary body recourse should be had to injections in the anterior chamber.

All the affections of the cornea and sclerotic are not equally influenced by sterilized air. The best success is met with in cases of superficial keratitis and episcleritis, while the deeper affections are more refractory. The most gratifying results were obtained in phlyctenular kerato-conjunctivitis, band keratitis, abscess of cornea, central and marginal ulcers and chronic ulcers with pannus. Hypopion ulcers, without dacriocystitis, are sometimes improved, but this should not be too confidently depended upon. In interstitial keratitis and scleritis the result was rarely satisfactory.

Subconjunctival injections of air, except perhaps in tuberculous cases which were not included in the experiments, have no specific action on the morbid process, but only a symptomatic one and should be considered rather as an adjunct to other methods of treatment. While alone their action may be *nil;* associated with the classic methods treatment, they may sensibly shorten the duration of the disease.

Injections of air act particularly in diminishing ocular pain, photophobia, epiphora, and blepharospasm and increase the efficacy of other therapeutic measures. Injections of air are not stimulating, but calming.

The duration of this mode of treatment need not be prolonged. When injections have been repeated every three days five times without effect, other methods of treatment should be tried.

G. C. H.

CONTRIBUTION TO THE TUBERCULIN CURE OF OCULAR TUBERCULOSIS.—KRAEMER, Stuttgart (*Die Ophth. Kl.*, Jan. 5, 1908), makes a plea for a systematic course of tuberculin in tuberculous ocular diseases because of the existence in other parts of the body of tuberculous foci. He pertinently remarks upon the important part the ophthalmic surgeon can play in the battle against general tuberculosis if he recognize the tuberculous nature of the eye condition and treats not only the ocular lesion, but the sick man.

W. Z.

ON EXPERIENCES WITH KOCH'S OLD TUBERCULIN IN DISEASE OF THE EYE.—SCHUMACHER, C. (From the eye clinic in the University of Kiel. *Zeitschrift fuer Augenheilkunde,* 1908, xix, p. 223). The method of Koch was in so far deviated from, as the injections were made into the upper arm, not between the shoulder blades. Thirty-one cases of parenchymatous, keratitis, uveitis and a case of fistulous dacriocystits, of undoubtedly tuberculous origin, showed typical general reaction, 60 per cent. local reaction. Twenty-four (77 per cent.) reacted to the first injection of 0.001.

Schumacher emphasizes that those cases (ten) in which, according to the clinical examination, a negative result was expected, gave a negative reaction, and vice versa, cases in which a positive reaction was expected reacted positively. Thus the generally acknowledged diagnostic value of old tuberculin was confirmed, as far as the general reaction was concerned.

Of the diagnostically doubtful cases 24 are mentioned which had either hereditary lues or tuberculosis. Nine cases of bilateral parenchymatous keratitis had, besides certain hereditary lues, tuberculosis of other organs and all gave typical general reaction. Out of 13 generally reacting patients 9 did not react locally, i.e., 70 per cent., while in the undoubtedly tuberculous eye affections only 40 per cent. did not react locally and of the cases with certain tuberculous keratitis 15 per cent. not locally. Therefore Schumacher considers only the local reaction as a certain proof, the general reaction in luetic and tuberculous individuals to be utilized only secondarily. He therefore instituted, besides antisyphilitic treatment, a tuberculin cure in cases which had given no local reaction, because eyes affected with tuberculosis had yielded local reaction only in a certain percentage.

In 10 (66 per cent.) out of 15 cases of etiologically not clear diseases of the uvea a general reaction was observed which corresponds with those of Stock and Brückner.

Out of the 76 cases of scrofulous ocular affections probatorily injected, more than 85 per cent. gave general (Stock 87 per cent., Renehlin 85 per cent.), more than 40 per cent. local reactions.

Schumacher, however, refrains from forming further conclusions as to the relations of scrofulous affections to tuberculosis, as long as no other findings render these probable.

Finally, he reports on the therapeutic results with new tuberculin observed at the clinic: Out of 24 cases of diseases of the uvea, e. g., partly very severe, 9 were cured, 7 which had existed for a long time and had gradually progressed were improved or made stationary, 7 showed slight relapses during the treatment, only one was refractory. Although the results were not as brilliant as von Hippel's, Schumacher gained the impression that the process became less acute and took a favorable course. It was therefore concluded to further employ tuberculin in all cases in which other remedies do not warrant a certain result. Especially it is to be applied in intraocular diseases as long as no better treatment has been found. C. Z.

Tuberculosis of Iris Diagnosed and Treated by Tuberculin.—Allesandro (*La Clinique Ophtalmologique,* Feb. 25, 1908). The case the author reports was a young woman who consulted him Feb. 20, 1906. There was then in the right eye pericorneal redness and photophobia; iris infiltrated and not responsive to light; V 5/lx. Atropin brought out posterior synechiæ. Patient did not return for a month, when several iritic nodules were discovered. To eliminate the possibility of syphilis, active antispecific remedies were tried, but without benefit. The nodules increased in size and became agglutinate. The parents rejecting operative measures, Allesandro began injections of Koch's tuberculin, and later the T. R. This treatment was carried on for some time with intermissions. On June 10, 1906, the tuberculous mass had completely disappeared. B. E. F.

Antidiphtheritic Serum for Hypopion Ulcers.—Monbouyran (*La Clinique Ophtalmologique,* Jan. 25, 1908). The author reports six cases successfully treated with the antidiphtheritic serum. Heretofore his experience with ordinary means in such cases resulted in the loss of the eye. From two or three subcutaneous injections of 10 c.c. of the serum were given at intervals of two or three days. B. E. F.

## MISCELLANEOUS.

Ophthalmological Society of the United Kingdom.—(Thursday, June 11, 1908. *Lancet,* June 27, 1908). Mr. Priestley Smith showed a series of skiascopic lenses in a small frame, sixteen being combined in a space of a linear foot, enabling very rapid examinations to be made. Mr. Leslie Paton showed a case with connective tissue in front of the optic disc.

Mr. P. Adams reported an epidemic of pneumococcus conjunctivitis in a boys' school, most of the cases being subacute. There was general congestion of the lower palpebral conjunctiva, with slight bulbar injection, and some follicular hypertrophy at the angles of the upper lid. The epidemic lasted about five weeks.

Mr. Nettleship reported some cases of hereditary eye disease, mainly cataract, discoid and lamellar, and ritinitis pigmentosa in a large number of persons in one family. The sex incidence and mode of descent was shown to be different in the cataracts and the retinal diseases respectively. The third case was that of a family with an unusually large percentage of color blindness.

Colonel Herbert discussed secondary, parenchymatous xerosis, and drew attention to the importance of pannus in the development of trachomatous xerosis, noting that old pannus renders the cornea insensitive. Hence, with both cornea covered, blinking motions are infrequent and the globe is exposed to drying. Reduced transudation of fluid from the palpebral conjunctiva is another factor, as there is no tearing on eversion of the lids in these cases, no matter how marked the inflammation. Lower corneal plaques or slightly raised, feebly vascular, gray patches with rough surfaces, generally multiple and bilateral, are seen in India, and are due to defective closure of the lids, together with more or less chronic conjunctivitis and trachoma. P. H. F.

A MAGAZINE FOR THE BLIND.—(*Scientific American,* May 16, 1908). Considerably more than a page of this issue is devoted to describing the *Ziegler Magazine for the Blind.* It has a circulation of about 8,000. The scope of the magazine is very broad. It gives a monthly review of current events, some standard literature, both prose and verse, short stories, a page of music, and a page of conundrums and jokes. Two editions are printed, one in New York point, the other in American Braille. The method of printing is fully described. The back cover page of each number of the magazine is illustrated. Usually a map is shown and an illustration of some prominent structure, such as the Brooklyn bridge, or the Statue of Liberty. Blind operatives are employed as far as possible. There are several engravings illustrating various phases of this work for the blind. M. D. S.

## MUSCLES.

THE TREATMENT OF SQUINT IN ADULTS WITHOUT OPERATION.—GARROW, A., Cape Colony (*Ophthalmoscope,* July, 1908). Two cases are reported of convergent squint, one aged 5, the other 26, whose squint was entirely overcome by correction of high plus errors of refraction, and orthopedic exercises. M. B.

CONGENITAL DEFICIENCY OF THE EXTRINSIC OCULAR MUSCLES.—WYLER, JESSE S., Cincinnati (*The Lancet-Clinic,* May 9, 1908). Among causes of motility disturbances are mentioned injuries during birth and hereditary influence. "Defects in the brain, morbid processes which limit motility, pathological changes in fetal life, all have their bearing upon the condition; and not at all seldom, diseases of the mother during pregnancy exert a considerable influence in this direction." Ptosis has been present in all cases of insufficiency. Any or all of the extrinsic muscles may be affected, but complications of the intrinsic have not been reported. He records fully a case with ptosis, loss of convergence power and all co-ordinate movements, having the maximum action in abduction with very little depression and constant oscillatory nystagmus. Microphthalmos is present. This case is similar to those reported by many observers. Steinham believes that in the developmental period muscular tissue is replaced by yellow elastic fibers with the loss of contractility; however, this condition can not be explained embryologically. The microphthalmos is believed to be due either to intrauterine inflammation or to developmental errors. By far the greatest number of reported cases have been upon the abduction apparatus of the eye. Several authorities on the subject, as Duane, Kraus and Heubner, are cited. The writer believes that when only one or possibly two muscles are involved, the future will show good results from tendon transplantation. M. D. S.

REPORT OF TWO CASES OF PALSY OF EXTRAOCULAR MUSCLE IN GRAVES' DISEASE.—POSEY, WILLIAM CAMPBELL, Philadelphia (*Ophthalmic Record,* June, 1908). A woman of 42 with well marked signs of Graves' disease presented a palsy of the right superior rectus muscle. A woman of 63 with well marked Graves' disease presented paresis of both external recti and of the left superior rectus and inferior oblique muscles. M. B.

ON NYSTAGMUS.—REID, A. C., Nottingham (*Ophthalmic Review,* June, 1908), reports some of the results of Barany's investigations and thinks that something would be gained if every movement of the eyeball that could be termed nystagmus were considered as a movement of recovery of disturbed equilibrium. Miner's nystagmus becomes intelligible on the assumption of labyrinthine irritation as a factor, depending on a rhythmical disturbance of the semicircular canals in succession, such as is probable in connection with the miner's swinging movements at the coal face. Barany distinguishes between undulatory nystagmus, the ordinary optical form, and rhythmical nystagmus, which Uhthoff and others call "nystagmoid twitching," and which is associated with stimulation of the vestibular organ, but he has been able to differentiate distinct types only by experimental and partial stimulation of the semicircular canals. Reid holds that a rapidly alternating stimulation of the vestibular organ on each side may produce an undulatory nystagmus; that it is very doubtful whether muscular fatigue in miners could cause forced eye movements, or anything more than a compensating twitching, analogous to fatigue tremor. Alcohol is undoubtedly a factor in many cases, but disturbance of body equilibrium can not be ignored, and it must be borne in mind that deficient light, interfering with vision, also greatly increases the difficulty of subjective orientation and equilibrium, both of the body and of the eyes. (Reid overlooks certain important clinical observations, thus the spontaneous development of nystagmus in miners on strained position of the eyes, independent of all body motion, and associated with intense vertigo, as reported by Graefe; the inhibitive effect of alcohol, and the possibility of disturbance of equilibrium by purely visual sensations). P. H. F.

## NERVOUS SYSTEM.

The Mechanism of Nystagmus.—Gowers, Sir W. R., London (*Ophthalmoscope,* June, 1908), presents as an explanation for nystagmus, reciprocal muscle-reflex action, due to disturbance of balance of the mid-brain structures which subserve this action. He thinks this explanation may present difficulties, but that they will probably lessen when they are fairly considered. M. B.

The Alterations of the Ganglion of Gasser and of the Sixth Nerve in the Course of Middle Ear Inflammation.—Baldonweek (*Annales d'Oculistique,* April, 1908). The association of these conditions is known as the Syndrome of Gradenigo, who described the symptom-complex consisting of (a) acute otitis media, (b) isolated paralysis or paresis of the abductor of the eye on the corresponding side, and (c) persistent and severe pain in the temporal and parietal regions. A frequent seat of the pain is orbital and periorbital and in the teeth, and it may be accompanied by epiphora and congestion of the conjunctiva.

The author opposes the reflex theory of causation and thinks that the symptoms are the result of a lesion at the point of the petrous bone. G. C. H.

## OPERATIONS.

Operations for Filtering Cicatrices.—Herbert, Lt.-Col. H. (*Ophthalmoscope*, July, 1908.) The author believes that much of the benefit of iridectomy is due to the formation of a cicatrix through healing of the sclerocorneal wound over entangled iris or otherwise. He thinks the value of iris-prolapse has not been fully appreciated. The iris-free filtering cicatrices have been formed by two methods and possibly two additional ones. Lagrange's operation has had the longest trial. The size of incision might be reduced in length, and a small basal iridectomy substituted for the large incision of iris now made. The question is whether the tension is not reduced too much in some cases. The author's operation gives perfect filtering scars, but he has not escaped an experience of both excessive and deficient reduction of tension. He believes greater uniformity of results obtainable by more care and attention to detail in operating. M. B.

Simple Sclerectomy; Its Principal Indications Exclusive of Glaucoma.—Bettremieux (*La Clinique Ophtalmologique*, March, 1908). Parinaud has recommended sclerectomy in retinal detachment; Lagrange includes in the operation an iridectomy. Bettremieux removes a segment of the sclera. He first turns down a conjunctival flap, passes a curved needle into but not through the sclera near the corneal limbus, and with a small Graefe cataract knife cuts out the portion included by the needle; and with two sutures brings the conjunctival flap into apposition. Bettremieux reports three cases in which this method was successfully followed.
B. E. F.

The Operative Exposure of the Chiasm and Hypophysis and the Extension of the Ethmoidal Cells Into the Supraorbital Plates.—Loewe, Ludwig, Berlin (*Zeitschrift fuer Augenheilkunde*, 1908, xix, p. 456). The exact diagnosis of affections of the hypophysis depends on ocular symptoms, especially contractions of the visual field. Ludwig therefore describes here his rhino-surgical study and method (illustrated by a drawing) for removal of tumors of the hypophysis, which, with slight modifications, has been successfully employed in six cases by von Eiselberg, Schloffer, von Hochenegg and Borchardt. Ludwig approaches the hypophysis from the nose, after removal of both plates of the superior maxillæ, of the lower turbinated bodies, the anterior walls of the frontal sinus, reflexion of the osseous roof of the nose to both sides, removal of the turbinated bodies and ethmoidal labyrinth, declination of the nasal septum, removal of the ossicula Bertini, the septum and the roof of the sphenoidal sinus, the dimensions of which having been previously ascertained by Roentgen rays. The extirpation of a tumor of the hypophysis must be only partial, to be compatible with life, since in the experiments of Horsley most animals died after removal of the whole hypophysis. Finally, Ludwig calls attention to the fact that the roof of the orbit may be separated in two lamellæ by an extension of ethmoidal cells between them. C. Z.

Early Transplantation in Combustions of the Lids.—Pfalz, Duesseldorf (*Deutsche Medizinische Wochenschrift,* 1908, No. 19, p. 823). The most favorable healing of combustions of the lids is ultimately frustrated by disfigurements in consequence of cicatricial retractions. This is due to the formation of granulation tissue, which has a never ending tendency to cicatricial shrinking. Pfalz therefore advises us to cover the defect, be it ever so small, with Thiersch's flaps, immediately after demarcation of the eschar. In defects of the conjunctiva the flap must be sewed into the upper or lower fornices. It must be done as early as possible, from the fourth to the sixth day after the injury. The remnants of the necrotic tissue must be removed with the sharp spoon. His results were excellent, making later plastic operation absolutely unnecessary. C. Z.

Canthoplasty.—Pick, Koenigsberg i. P. (*Duetsche Medizinische Wochenschrift,* 1908, No. 13, p. 552). After the usual method of canthoplasty the conjunctiva is frequently exposed to an increased tension and traction, so that the sutures cut through and the original effect is frustrated. It is altogether insufficient in shrunken conjunctival sacs. Pick therefore devised the following operation, which, in fifty cases, gave perfect therapeutic and cosmetic results: From the temporal angle the skin is incised with a scalpel in a length of from 4 to 8 mm. After insertion of the lid speculum the fibers of the fascia connecting the angle with the periosteum are cut with scissors and the ocular conjunctiva as far as possible undermined. From the angle the conjunctiva is incised in the shape of a lying V which is freed and with three sutures united with the wound edges of the skin. Dressing with vaselin and removal of the sutures on the sixth day. C. Z.

TRICHIASIS AND ENTROPION OPERATION.—WYN, P. (*Geneesk. Tydschr. v. Nederl. Indie,* Vol. 48, 1), believes that in many cases trichiasis is due to the much greater shriveling of the conjunctiva in trachoma than the tarsus and therefore is the expression of this disturbed relation. This induced him, where the conjunctiva may be expected to shrivel more, to let the tarsus shrivel artificially at the same time, i. e., to remove a part of it. He does not remove a wedge, like Snellen, but a bar (parallelopipedum) of the thickness of the tarsus, 1.5 to 2 mm. thick. This leaves relatively too much of conjunctiva tarsi, which he expects will lessen the danger of relapse. STEINER.

FURTHER COMMUNICATION UPON THE INSERTION OF AN ARTIFICIAL TEAR SAC.—ZIMMERMANN, Gorlitz (*Die Ophth. Kl.,* Dec. 29, 1907), reports further on the cases presented by him at Dresden, September, 1907, and adds seven new cases. All have done well, the prothesis having been retained without discomfort and giving perfect drainage. He contrasts the results of his experience with extirpation without the insertion of an artificial sac, which has been that there is constant complaint of lacrimation. In the past two years he has been obliged to excise the palpebral lacrimal gland in a number of cases. W. Z.

EXTIRPATION OF THE ORBITAL LACRIMAL GLAND AFTER REMOVAL OF THE TEAR SAC AND THE PALPEBRAL LACRIMAL GLAND.—GROENOUW, A., Breslau (*Centralblatt fuer praktische Augenheilkunde,* 1908, p. 100). In most cases of extirpation of the tear sac the patients are satisfied with their condition; in some, however, the lacrimation is so troublesome that it requires further operations. As a rule, the removal of the palpebral lacrimal gland, according to de Wecker, will be chosen as the more simple operation, which may be performed without narcosis. If this is not sufficient the orbital lacrimal gland must be removed, as Groenouw did in his case and obtained a perfect result. The lacrimation was very slight indoors, and only a little outside in cold weather. Cases are, however, known in which annoying lacrimation persisted after extirpation of both lacrimal glands. C. Z.

THE PRINCIPLES ON WHICH IS BASED MY OPERATION FOR CICATRICIAL ECTROPION OF THE LOWER LID.—HOTZ, F. C., Chicago

(*Ann. Ophthal.*, April, 1908). The reason why operations for cicatricial ectropion fails is because the newly formed lower lid is not anchored to the infraorbital margin. If this is not done the traction from the skin of the cheek again causes eversion of the lid. The author prefers to use the cicatricial skin, which usually extends from the everted lid more or less far into the cheek. He cuts a large semilunar flap, which in connection with the lid border is dissected up and mobilized until the lid can be placed in its normal position. The next step is to reduce the overstretched border to the proper length by removing a suitable piece at the outer canthus. This done the margin of the lid flap is fastened by numerous fine sutures to the tarso-orbital fascia just above the infraorbital margin. Finally the lid margin is drawn up as far as possible and held in this position by two ligatures fastened to the forehead by plaster strips. The wound area below the lid is covered by a separate Thiersch flap cut from the skin of the arm. If cicatricial skin is not available, and Wolff or Thiersch flaps are used, two flaps must be used, one for the lid and one for the cheek. and the lid flap sutured to the lid border above and to the tarso-orbital fascia below. M. B.

THE RESTORATION OF CONTRACTED SOCKETS.—ZENTMAYER, WM., Philadelphia (*Ann. Ophthal.*, April, 1908). Thiersch grafts introduced by spreading over a glass ball and thus held in position is recommended. In the case of bands, introduce a suture under the band near each end attachment, cut midway between, then tie sutures over end of band, thus inverting and tucking it in, and bring the intervening raw surface together with sutures. M. B.

EXTIRPATION OF THE LACRIMAL SAC.—KUINDERS, H. J. (Doctorate thesis) describes the results of 52 patients operated on, eleven of which he operated on himself, the rest being done by Prof. Mulder at Groningen. Thirty-eight were female patients (73 per cent). The age varied between 4. 5 and 74 years. Six times the operation was done on both sides, so that 58 extirpations were performed; in 50 cases healing was by primary intention (86, 2 per cent). In recent years the operations were performed under local anesthesia: the sac before the operation is syringed with a 1 to 5000 sublimate solution, thereafter filled with 1 cc. 2 per cent. cocain and two drops adrenalin. The skin being disinfected the 1 cc. 2 per cent. cocain solution, with 4 drops adrenalin is injected subcutaneously where the incision is going to be made. One must be careful not to wound the anterior wall of the sac. After ten minutes the operation can be done without pain and bleeding. Kuhnt's method is followed, as the sac is always found without danger of incision and one does not come in the orbital fat. One assistant is necessary unless the Mueller speculum is inserted horizontally and that of Axenfeld vertically. But as Axenfeld's speculum has too strong a spring for a skin with lessened elasticity Kuinders had one made similar but finer and with a weaker spring. At first after the operation the ductus nasolacrimalis was curetted later only when suspicion existed that the mucous membrane of the lacrimal canal was inflamed. The wound is closed with three or four sutures through skin and subjacent tissue and not drained; in one of the sutures the ligamentum internum is taken up to prevent dislocation of the internal angle. A compressive bandage with boric acid salve is changed daily, after three or four days the sutures are renewed and in a few weeks the linear cicatrix shows only very slightly.

The indications for removal of the lacrimal sac are: All cases of disease of the tear ducts, when social conditions do not allow a conservative therapy: stenosis of the duct with ectasia of the sac and the condition of the structure being such that ordinary treatment does not give results; dacriocystoblennorrhea, with ulcus serpens corneæ, or when an operation of the bulb is necessary.

Kuinders wanted to find out if extirpation of the sac produces atrophy of the lacrimal gland; he therefore extirpated the lacrimal sac in nine rabbits and compared the lacrimal gland of the same side with the one of the non-operated side about nine months later: he found the difference in weight so small that he considers it valueless, so he did not feel warranted to draw conclusions regarding atrophy from the average size of the tubuli. His experiments therefore do not support the opinion that the lessening lacrimation after extirpation of the lacrimal sac depends on atrophy of the corresponding lacrimal gland.

Does the eye tear when indoors? Forty-one of the 52 patients have answered: 28 (68.3 per cent.) stated that the eye did not tear. 6 (14.6 per cent.) that it teared little, 7 (17 per cent.) that it teared.

Does the eye tear when outdoors and the wind is blowing? Forty (97.5 per cent.) answered positively, only one (2.4 per cent.) no.

Did the lacrimation become better or worse after the operation? The condition had improved with 34 (82.9 per cent.), with 5 (12.2 per cent.) it had remained the same and with 2 (4.8 per cent.) it had become worse.

None of the 52 patients found his condition so troublesome that he wanted to undergo the operation for extirpation of his lacrimal gland.

Conclusions: Extirpation of the lacrimal sac is not a difficult operation, and quickly accomplishes its purpose, namely, the quick removal of a source of infection from the eye and the abolition of a troublesome epiphora.

The lessening lacrimation after extirpation of the sac is not consecutive to an atrophy of the corresponding lacrimal gland, but is due to the small quantity of tear fluid, which is secreted normally.

E. E. B.

## OPTICS.

Diseases of the Eye by Ultraviolet Rays of Glaring Sources of Light and Protection Against them Through a New, in Thin Panes, Colorless Glass.—Voght, Alfred, Aarau (From the eye clinic of Prof. C. Mellinger in the University of Basel. *Archiv. fuer Augenheilkunde,* lx, 2 and 3, 1908, p. 161), gives a very interesting and complete discourse on the physical, physiological and pathological actions of the ultraviolet rays on the eye, which form an essential part of our modern sources of light. He shows how, in high concentration, they are deleterious to the healthy eye, produce conjunctivitis, keratitis, iritis, opacities of the lens and chorio-retinitis, and influence existing diseases of the eye unfavorably. He then discusses the question by what means this deleterious effect of glaring sources of light may be prevented. An ideal protecting glass must fulfill two conditions: 1, ability, in the usual thickness, to absorb all, or at least the greatest portion, of ultraviolet rays; 2, lack of color.

The grayish yellow glass of Fieuzal proved very useful as material for protective cataract spectacles. Its disadvantages consist in diminishing or abolishing the faculty to discriminate between colors and in the conspicuousness of its color. As the admixture of lead in the chemical composition of a glass has been found to increase the power of absorption of ultraviolet rays, Vogt made experiments in that direction. Upon his device the factory of Schott and Gen, at Jena, succeeded in producing such a glass. This "Schwerflint 0.198," in thin panes (1 to 2 mm. thick), is almost colorless, in panes 10 mm. thick it is slightly yellow. Careful examinations showed that it absorbs in the thickness of the ordinary lenses (1 to 3 mm.) all ultraviolet rays to a small fraction, and transmits all visible rays except a small fraction of violet and blue.

Vogt points out that his glass can not supplant smoked spectacles in diseases of the cornea, iris, etc., with considerable photophobia, as this diminishes the intensity of all kinds of rays. The Schwerflint, however, will prove of great service as material for lamps, to guard the eye against the glaring of electric, Welsbach, acetylin lights, etc., especially in factories, schools, sick room, without diminishing the intensity of light.

Spectacles of Schwerflint are recommended in incipient senile cataract or disposition to it, aphakia, conjunctivitis and keratitis, especially if caused by ultraviolet rays, chorio-retinitis of the macula and other ocular affections which may be produced by ultraviolet rays, then as handy colorless protective glass in mountain tours, against diseases caused by certain vocations, e. g., the cataract of glass blowers, blacksmiths and founders, and against electric ophthalmia. C. Z.

DISPERSION OF LIGHT IN OPAQUE MEDIA OF THE HUMAN LENS (CATARACTA COERULEA).—ISAKOWITZ, J. (From the eye clinic of Prof. H. Schmidt-Rimpler in the University of Halle a. S. *Zeitschrift fuer Augenheilkunde*, xix, 1908, p. 401). Generally the typical blue foci of the lens are observed only in the congenital forms of cataracta coerulea, especially in young individuals up to the 30th year, but their occurrence is not limited to a certain clinical picture. The author explains the bluish green color of these lenses by dispersion of light in opaque media, in accordance with the investigations of Lord Rayleigh. The single minute particles act as apertures of infraction of very small dimensions, and therefore furnish diffusely infracted, dispersed, light. It is analogous to the blue color of some emulsions, e. g., milk, mixed with water, of smoke before a dark background, of the sky and the bluish green of deep strata of waters, of the iris, respectively green in more pigmented irides, and the sclera. The blue rays originate in the sclera, the pigment of the chorioid does not shine through, it serves only as dark background. Opacities of the vitreous after hemorrhages show sometimes a distinct bluish tint, also postneuritic atrophy of the disc, in which the remaining connective tissue acts as opaque medium. The grayish green or blue reflexes from glaucomatous eyes or from the pupils of old people are probably also phenomena of infraction. The greenish color from the pupils of older people is caused by the modification of blue by the yellow color of the senile lens. C. Z.

## OPTIC NERVE.

Cavernous Atrophy of the Optic Nerve.—Stock, W. (From the eye clinic of Prof. Th. Axenfeld in the University of Freiburg i. B. *Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 1, 1908, p. 342), gives the anatomic descriptions of eight excessively myopic eyeballs; five of these showed lacunar atrophy, a condition which so far has only been observed in glaucoma and myopia. In Stock's opinion the similarity of both processes lies in the traction on the nerve fibers. This traction, however, has entirely different causes in each. In glaucoma the retina is firmly pressed against the chorioid, so that the nerve fibers, especially at the margin of the disc, are absolutely fixated. The lamina cribrosa as the least resistant part of the eye is pressed backwards. As the retina does not give way, the nerve fibers, stretched over the papillary margin as over the edge of a knife, are drawn through the holes of the lamina cribrosa. As the fibers become medullated behind the lamina, they can not pass through the narrow holes and are partly torn off and lacunæ are formed.

In myopia the eyeball grows larger, and the retina must cover a larger space, so that the nerve fibers will be very much stretched and will be pulled from the disc into the eye. Since they are thicker behind the lamina, on account of their medullary sheath, and therefore can not pass through the holes of the lamina, some fibers will be torn and the same changes will follow as in glaucoma.

This tearing is the reason why simple atrophy does not follow. If an optic fiber degenerates slowly the glia has time to grow to cover the defect. If, however, the nerve fiber is torn, a gap follows which becomes filled with fluid, so that the glia has no opportunity to cover the defect.

With regard to the cases of Schnabel of lacunar atrophy in glaucoma in which the lamina was not displaced backwards, Stock says that the lacunæ were formed in the manner described above, but that after relaxation of the pressure the lamina resumed its normal position. The possibility must not be ignored that after enucleation the intraocular pressure sinks, and the lamina through its elasticity returns to its normal position. (We refer to the recent publications of Schnabel, reviewed in this number of Ophthalmology. Reviewer).

These changes in the optic nerve of myopic eyes must lead to atrophy of the ganglion cells, while the remaining retina is still normal. This would explain, as pointed out by Axenfeld and Polatti, the considerable visual impairment of myopic eyes, in which the macular alterations are not very great. Sometimes they show a slight pallor of the disc, which may be ascribed to atrophy from the laceration of the nerve fibers. C. Z.

Remarks on Pathologic Excavation of the Optic Nerve.—Schnabel, J. W., Wein (*Zeitschrift fuer Augenheilkunde*, 1908, xix, p. 556). In reply to an article in von Graefe's *Archiv.*, 68, 2, Schnabel states briefly his views on the subject: 1. Out of the many thousand cases of atrophy of the optic nerve seen by him, which had no glaucoma, not one showed an ophthalmoscopically noticeable pathologic excavation. Every pathologic excavation which is seen ophthalmoscopically is glaucomatous. 2. In many optic nerves with glaucomatous excavations, examined ophthalmoscopically or anatomically, or both, by Schnabel, the lamina cribrosa was in its normal position. The pressure excavation is only imaginary. The only actually existing pathologic excavation, the glaucomatous excavation, is produced by a special form of disappearance of nerve fibers, and therefore is an atrophic excavation.

C. Z.

An Infrequent Type of Optic Nerve Atrophy.—Hansell, H. F., Philadelphia (*Jour. Am. Med. Ass'n.*, July 25, 1908), reports two cases due, respectively, to acute disease of the accessory sinuses, and to syphilis. The clinical picture of intracranial optic neuritis, according to Gradle, is: Sudden diminution of sight without central scotoma and with nearly normal field, tendency toward recovery but possibly ending in incomplete atrophy, with absence of all other symptoms except initial headache. In sinus disease there is always a central scotoma, if the case is examined early enough (A. Knapp). The disc may show all the signs from acute neuritis with retinal edema to a fine, almost imperceptible, deeply seated paleness. In Knapp's case there was pronounced neuro-retinitis with a radiating figure of white lines and dots about the macula. The presence of pupillary disturbance and ocular muscle paralyses indicates that the lesion is not limited to the intracranial portion of the optic nerve but has extended backward toward the chiasm or forward into the sphenoidal fissure. Headache is a common symptom. It is violent and almost continuous in sinus disease, and paroxysmal in syphilis. It is not characteristic. In the discussion, Huizinga reported a case of optic nerve atrophy due to ethmoid sinus disease in which relapses followed renewed infection, and improved whenever drainage was re-established by operative intervention. P. H. F.

Differential Diagnosis of Affections of the Optic Nerve. —Friedenwald, H., Baltimore (*Jour. Am. Med. Ass'n.*, Aug. 8, 1908), notes the importance of carefully considering not only the ophthalmoscopic appearance of the nerve-head but the functions of the nerve as tested for acuity of central and peripheral vision and color perception, and their changes during the progress of the disease as well as the connection of these data with the previous history and habits of the patient, and with such other ocular, constitutional, organic, and especially nervous diseases as may be discovered. Descending neuritis with the picture of choked disc is generally due to brain tumor. It is bi-lateral except in rare cases of tumor in the middle fossa. There is at first little or no visual disturbance, the central vision is unimpaired, and the enlargement of the blind spot is easily overlooked. Complete transient obstruction of vision is, however, a frequent and characteristic symptom. Atrophy develops late, causing rapid and marked loss of sight. Other causes are cerebral abscess, serous meningitis, hydrocephalus, nephritis and anemia, and unilateral choked disc may be due to orbital causes or to meningeal syphilis descending along the nerve sheath. Spontaneous recovery is rare except in children or when due to hemorrhage or to syphilis. In descending neuritis with slight swelling or changes in the vessels, but with exudate veiling the contour of the disc, vision drops rapidly. Bilateral forms are usually due to meningitis, especially the tubercular or syphilitic basal type. The epidemic form causes neuritis in 16 per cent. of the cases. It may result from nephritis, and frequently leads to post-neuritic atrophy. In atrophy it may be difficult to distinguish between simple and post-neuritic forms. The former is generally of spinal origin, beginning at the bulbar end of the nerve. Disc pallor and visual disturbance occur simultaneously.

In one form there is marked diminution of vision throughout the entire field, with marked contraction of the color fields. Deterioration is rapid, hastened by mercury, and prognosis is absolutely bad. A second class is characterized by sector-shaped defects in the field of vision, with normal function, at least for quite a time, in the remaining portion, closely resembling retrobulbar perineuritis with secondary atrophy of the disc. A third variety shows concentric contraction of the field with good central vision and good color vision in the portion preserved. Similar fields are found in syphilitic disease of the intracranial portion of the optic nerve. The last two classes are benefited by mercury. True primary optic atrophy never occurs in cerebral syphilis, not, in all probability, in spinal syphilis, and is practicaly excluded by the presence of a central scotoma. Limitation to one eye, variations in visual function, complication with other cerebral nerve palsies, Argyll-Robertson pupil, and hemiopic defects, all speak in favor of a secondary atrophy due to syphilis. This form may also be caused by pressure on the nerve by tumor, rigid carotids or by embolism and thrombosis, as well as by retinal or chorioidal disease, and by injury of the nerve in the optic canal, either directly or by indirect violence. Normal discs may be found in acute or chronic forms of retrobulbar neuritis. The alcohol-tobacco toxic type is the most common, with a long but narrow paracentral scotoma, reaching from the point of fixation to Mariotte's blind spot. The course is generally very slow, and great improvement or even recovery is possible. There is usually pallor of the temporal half of the disc. In poisoning from quinin, salicylic acid, methyl alcohol and other drugs, there is marked contraction of the blood vessels and early blindness. Lead poisoning produces papillitis, with marked vascular changes. Accessory sinus disease, influenza, syphilis, menstrual disturbances, rheumatism, are also factors. P. H. F.

A NOT MUCH KNOWN TYPICAL MALFORMATION AT THE OPTIC DISC: CIRCUMSCRIBED DEPRESSION AT THE OPTIC DISC.—REIS, W. (From the eye clinic of Prof. H. Kuhnt in the University of Bonn. *Zeitschrift fuer Augenheilkunde*, 1908, xix, p. 505). As this affection is not mentioned in most of the text-books, Reis gives a very complete review from literature, which contains fifteen cases, and reports four of his own observation. In the majority of cases vision and visual field were normal, and if not it was due to other complications. So far no histological examination has been made of a case which had been observed ophthalmoscopically. It is a congenital affection and most likely related to coloboma of the optic nerve, due to dehiscences in the lamina cribrosa. Elschnig found anatomically in colobomata of the entrance of the optic nerve pocket-shaped duplicatures of rudimentary foundations of the retina, which apparently were caused by abnormal growth of the borders of the secondary ocular vesicle into the tissue of the head plates. Reis thinks that the same process occurred in the formation of depressions to a very limited degree, so that otherwise the development of the eyeball to its full shape was not interfered with. The condition is illustrated by four colored pictures. One of Reis' cases exhibited a hole in the macular region, an affection originally described by Kuhnt and Haab. It was most likely due to local hydrops of the retina in the macular region, which Reis, from his clinical observations, considers as preliminary to central atrophy of the retina. C. Z.

## PATHOLOGY.

Iridocyclitis.—Wentzel, J. M. (doctorate thesis) draws attention to the few cases of true cyclitis described in literature. Cyclitis is the keratitis punctata of the English and the same as descemetitis, iritis serosa, etc. Following Straub, he makes a distinct difference between hyalitis and cyclitis. In hyalitis the corpus vitreum is infected, and here we find the exudate, which, according to modern teachings, tries to combat the penetrating virus; the inner layer of the ciliary body is found hyperemic and infiltrated, but this is no reason to call the inflammation cyclitis, as we would not speak of marginal keratitis when infiltrates around the marginal vessels of the cornea are found with a central corneal ulcer. In cyclitis the battle between microbes and exudate is fought in the corpus ciliare propria; the vitreous body participates in the same way, as do all other surrounding tissues.

Wentzel examined microscopically a bulb sent to the Amsterdam laboratory without clinical history. The anatomical examination speaks very much in favor of a syphilitic infection.

The intraocular part of the optic nerve was swollen 0.77 mm. through serous fluid which filled evenly all interstices; *in vivo* it must have shown the picture of choked disc. It must have been produced through the action of chemical products of decay, which are transported through the vitreous body to the optic nerve. The lymph of the vitreous body leaves the eye along the sheaths of the central retinal vessels. The physiologic excavation is closed by a fine newly formed membrane, which goes over the surrounding retina, resting upon the limitans interna; it is formed by spindle cells with oval nuclei. The retina in general shows little signs of participation, but vessels are arteriosclerotic, which speaks in favor of syphilitic origin of the process and in different places the retina is loose from the chorioid, especially in a circular zone around the disc. It shows how such eyes can become blind.

The chorioid is a little changed, its vessel walls are hypertrophic. The cornea is edematous and has vessels in the deeper layers ("in the anterior third part many blood vessels"); the membrana Bowmanii and Descemetii both are folded. We may accept in this case that the cornea became edematous under the influence of a poisonous chemical substance produced in the inflammatory foci and transported to the other parts of the eye by diffusion. The action of these poisonous substances was very mild, as the corneal inflammation became serous only, but it seemed to be sufficient to stimulate vascularization.

The vitreous body has shrunken but is still connected with the ora serrata and ciliary body. The posterior part of the cavity was *in vivo* filled with fluid, probably a secretion e vacuo from retina or chorioid. The collapse of the vitreous body is primary, due to the diminution of lymph secretion, which normally the corpus ciliare produces. Some leucocytes are found in the vitreous body posterior to the lens and in the neighborhood of the corpus ciliare.

The anterior chamber has nearly disappeared, as the iris touches the folded membrana Descemetii, and even in some places it is adherent, while the anterior lens pole is adherent to the cornea.

The anterior lens capsule is folded; under it are found some layers of newly formed tissue (cataracta poralis anterior). Most fibers of the zonula Zinnii are covered by the proliferation and infiltration of the corpus ciliare. The anterior capsule is adherent to the iris and the cornea in many places (synechiæ). The vessels of the iris are arteriosclerotic, the thickening of the walls is chiefly due to hyalin. The iris contains three well defined leucocytic infiltrations; the largest one is circular, in the pupillary part, over and under the sphincter, leaving the musculus sphincter free. The two other infiltrations are much smaller, located at both borders of the medium third of the iris, vessels with thickened walls pass through. We find at the posterior side of the iris proliferation of connective tissue, which produced marginal and for a small part surface-synechiæ, consisting of well formed spindle cells; following the same direction, with pigment at the pole of the nuclei, they come from the substantia propria iridis; the connection is shown in many places. At the posterior surface of the iris are seen here and there tissue-folds, which appear after bleaching to consist of epithelial cells. The corpus ciliare showed an artificial detachment from the sclera behind the canal of Schlemm; the processus ciliares and the anterior angle of the ciliary muscle with the loose tissue between these two elements is dragged forward, partly consequent to the disappearance of the anterior chamber, partly to cicatricial shortening of the newly formed connective tissue between corpus ciliare and posterior surface of the iris. The ciliary muscle is nearly everywhere intact. In the connective tissue between the ciliary muscle and the pigment epithelium layer four well limited fresh infiltrations of leucocytes are found, the first is situated between the anterior point of the ciliary muscle and the insertion of the iris, in the same meridian connects with both the infiltrations of the pars ciliaris iridis. The cells are mononuclear and everywhere capillaries are seen. The second and third infiltrations are found in the vascular layer of the pars plana. They measure about 0.4 to 0.45 mm. antero-posteriorly, and 0.15 to 0.2 mm. in thickness. The fourth infiltration is in the vascular layer above the ora serrata and is the smallest. In direct contact with the central margin of the ciliary muscle an infiltration with leucocytes begins, continuing from the processus ciliares till behind the ora serrata, which is in accord with a marked accumulation of leucocytes in the large veins of the pars plana. The pigment epithelium at the ora serrata is intact and shows the centrifugally directed folds, called by Treacher Collins the glands of the ciliary body. More forward the pigment epithelium is substituted by a layer of differently directed bundles of spindle cells. Near the ora serrata this spindle-cell layer is found between the pigment cylinder-epithelium. More anteriorly at the processes ciliares the pigment epithelium is seen again. The cylindrical epithelium changes its location near the ora serrata; in many sections it is folded, forming bubbles between pigment and cylindrical-epithelium. In the part turned to the pigment epithelium they contain newly formed tissue, formed by pigmented and unpigmented cells, under which the spindle cells are the most important. More forward the epithelium becomes thicker, consisting of some cell-layers, resting directly on the pigmented fibroblast-layer. The cylindrical epithelium is partly lost, until the ciliary processus, when both epithelium-layers can be readily recognized. Before the cylinder epithelium, or before the place where they ought to be, in the entire region of the corpus ciliare from the ora serrata past the ciliary processus, newly formed strands are found, which stretch out about in the course of the zonula Zinnii, the thinnest on the processus ciliares and near the ora serrata and the thickest off the pars plana. They are intimately connected by anastomoses; lie in the condensed tissue of the vitreous body and contain more pigment farther away from the ciliary body. Part of these strands are formed undoubtedly by blood vessels. From the ora serrata a distinct net of capillaries stretches forward in this layer, the walls of which possess oblong nuclei and the contents red blood corpuscles. Here and there the place can be seen, where the corpus ciliare is perforated and the capillaries go over in the vascular layer. Some strands consist of spindle cells, they have very thin lumina, but no red blood corpuscles are found in them. In this case the cyclitic membrane had not yet formed such a continuity as is usually found.

If we consider that directly on the proliferated spindle-cell layer a capillary network lies, consisting of a network of lightly pigmented strands, that follow one or two layers of stronger pigmented strands, then we reach the idea, that the strands have been first arranged as a neat network of capillaries, later are pushed forward and substituted by a new network of capillaries. In the capillaries pushed forward the cells became larger and thicker, so that the lumen closed entirely or partly, and the cells, descendants of the chorioid, became pigmented. Schiess-Gemuseus first, and later Kuhnt, expressed the opinion that these strands are vessels.

What is the biologic significance of this formation of vessels in the exterior layer of the vitreous body? Evidently the epithelium first dies and afterwards in the breach between the vitreous body spindle-cell bundles and vessels have grown, the earliest vessels penetrating the most anteriorly. This same condition is found not only in cyclitis but also in hyalitis and traumatisms, whenever the vitreous body becomes disturbed. The embryonic vitreous body contains vessels in connection with the arteria centralis retinæ and the corpus ciliare; the vessel formation in the pathologic vitreous body starts from the same places. It may therefore be that this so easily appearing vascularization is a return toward the embryonic condition. This vessel formation is a defensive measure, which in some cases will be of great significance. Chemotropic influence may instigate this new formation. E. E. B.

## PHYSIOLOGY.

Histologic Examination of the Obrital Lacrimal Gland from an Old Case of Trachoma.—Truc and Peretz (*Revue Generale D'Ophtalmologie,* June 20, 1908). The case the writers report was one of chronic and long standing trachoma, in which there was facial paralysis and incurable epiphora. Removal of the gland brought about a cure.. The histologic finding is given in full in the paper. B. E. F.

Experimental Investigations on Intraocular Tension and the Qualitative and Quantitative Intraocular Change of Fluids.—Wessely, K. (From the eye clinic of Prof. C. Hess in the University of Wuerzburg. *Archiv. fuer Augenheilkunde,* lx. 1. 2 and 3. 1908, p. 1), discusses the methods of measuring the intraocular tension and their shortcomings and shows as the first principle of exact manometry that the contents of the eyeball are neither increased nor decreased, i. e., that not a trace of aqueous or vitreous escapes into the manometer, nor fluid from this into the eye. He therefore constructed a new registering manometer which fulfills all necessary requirements and writes curves on the kymographion. The whole apparatus, which is described in detail, is nothing but a minute Marey's capsule filled with liquid.

Under technical details in carrying out the experiments, Wesseley emphasizes as absolute necessity to register at the same time the blood pressure (in the carotid artery of the other side). The results showed the dependence of the intraocular tension from the blood pressure. If the intraocular tension is normal the pulsating elevations are plainly visible a fraction later than the arterial pulse. The respiratory fluctuations correspond exactly with those of the blood pressure. With the same increase of blood pressure the intraocular tension rises relatively more, if it was at first low, than if it was high, and with the same decrease of blood pressure the intraocular tension sinks relatively more if it was at first high than if it was low. Wessely infers from the dependence of intraocular tension upon blood pressure that the increase of blood pressure, which occurs transiently in psychic excitement, permanently in arteriosclerosis and other general disturbances, may have a certain influence as eliciting cause in the etiology of glaucoma.

The next chapter deals with the action of intravenous injections of adrenalin on intraocular tension, with reference to former experiments of the author on local action of adrenalin. Three factors competing with one another are observed in the eye of the rabbit: general increase of blood pressure, local vasoconstriction and contraction of the smooth orbital muscles, with predominance of the two factors for raising the pressure.

In investigating the influence of the sympathetic nerve on the eye, Wessely found as the most important effect of excitation of the sympathetic nerve vaso-constriction with subsequent decrease of tension. This is less marked in cats and dogs than in the rabbit. Cutting of the sympathetic nerve produced hyperemia of the interior, nutritive, blood vessels of the eye, more pronounced pulsatory and respiratory fluctuations and gradual increase of intraocular tension.

The influence of anemia on the eye by tying the carotid artery was instantaneous decrease of tension, which, after removing the constriction, rapidly rose to its former level. The percentage of albumin in the aqueous of the homolateral eye was much less than that of the other eye after puncture.

Wessely thus summarizes the practical result of his experiments on passive congestion by constriction and suction: Passive congestion by constriction might be employed in orbital affections, that by suction in disease of the lids, conjunctiva and cornea. For producing interior hyperemia of the eye the first is not fit, the second dangerous, because the tension is considerably increased and afterwards diminished. Most likely the pressure exerted on the eye is the cause of the interior hyperemia.

The last chapter contains the experiments of Wessely on the action of subconjunctival salt solutions, which proved that the hyperemia of the interior of the eye is caused, not by the chlorid of sodium, but by reflex from the irritation on the conjunctiva. The injections produce a high, although rapidly disappearing, rise of tension, owing to the hyperemia and the accumulation of the more freely secreted ocular fluids. The qualitative changes of the production of fluids, especially the increase of albumin and antibodies, are the most prominent experimental effect of subconjunctival injections.

Wessely concludes from his experiments that there are two forms of hyperemia in the eye, entirely different in their action on the intraocular tension. The one, with vaso-dilatation after cutting the sympathetic nerve as prototype, causes no considerable rise of tension, but an increase of the pulse volume in the eye: the other, the reaction hyperemia after irritations, is followed by great rise of tension, partly due to augmented secretion of fluids, so that the increase of the pulse volume is, in comparison to the high tension, relatively smaller. This may be due in the one case to the fact that the hyperemia involves also the veins, whereas in the other it is confined to the arteries and capillaries. Both kinds are combined with a qualitative change of the production of aqueous, and the differences seem to be only gradual.

This brief review may suffice to arouse the interest of the reader to study the original, in which we can not help admiring the ingeniousness and exactness of the experimental methods, observations and far reaching practical conclusions of the well known author.

C. Z.

## REFRACTION AND ACCOMMODATION.

ERRORS OF THE REFRACTION AND BALANCE OF THE EYES AND THEIR BEARING UPON THE GENERAL HEALTH.—SHANNON, JOHN R., New York City (*American Medicine*, May, 1908), emphasizes the necessity of using a cycloplegic in order to secure accuracy in refraction. He quotes several authorities showing grave systemic effects from uncorrected errors of refraction, among them being Dr. Robert T. Morris, who says that many cases of intestinal fermentation are dependent upon eye-strain. The results of investigation of the eyes of school children made in different places are mentioned. The writer concludes with a number of illustrative cases.

M. D. S.

OVER-CORRECTION OF HYPERMETROPIA AS A METHOD OF TREATMENT OF ASTHENOPIA.—FRIDENBERG, PERCY, New York (*Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 1, 1908, p. 21), recommends in cases of asthenopia which are not at all, or only temporarily, improved by full correction, careful correction of the astigmatism and spherical over-correction by + 1.00, so that vision is reduced from 20/xx to 20/xxx, from 20/xxx to 20/lx. If, after wearing these glasses for a while, the distressing symptoms have disappeared, the over-correction may be diminished or entirely discarded. The reason is that by this "fogging method" the accommodation which would make vision still worse is involuntarily relaxed and after some time the stimulus to it is suppressed. The asthenopia is generally due to spasm of accommodation and the therapeutic object in all cases of tonic spasms is less to obtain rest and immobilization, as brought about by cycloplegics, than light work by gradually progressing exercise and massage. By over-correction the accommodation for near work is not rendered impossible, as by atropinization, but promoted and made easier. Thus the eye may accomplish a certain amount of near work without effort, the advantages of relaxation of accommodation being obtained without the disadvantages of cycloplegia. C. Z.

RELATION OF SO-CALLED OPHTHALMIC MIGRAINE TO EPILEPSY. —HUBBELL, A. A., Buffalo (*Jour. Am. Med. Ass'n,* Aug. 8, 1908), believes that these affections are two distinct forms of neurosis, and doubts that a genuine transformation of one into the other ever takes place, although Gowers, Féré, Charcot, Moebius and others claim that they are related, and Spiller has recently reported two cases in which he finds a connecting link in transitory paresis, paresthesia and disturbances of speech. These supposed "connecting link symptoms" are not essential to true epilepsy, and not necessarily forerunners or concomitants of it. The great disproportion in frequency between the two neuroses also speaks against this theory. Migraine is common, epilepsy rare; and while transitory paresis and paresthesia are frequently noted in the former, there are thousands in whom these symptoms never develop into epilepsy and in whom there is no family history of the disease. The two affections may, of course, occur in the same individual, but the attacks are entirely separate and independent. The clinical picture may be modified, both as to migraine and to epilepsy, by the association, but this proves neither kinship nor transformation. Of late years Gowers seems to have come to a similar conclusion. P. H. F.

MIGRAINE, AN OCCUPATION NEUROSIS.—WALTON, G. L., Boston (*Jour. Am. Med. Ass'n.*, July 18, 1908), thinks this affection involves the visual centers, those for divergence and convergence in the frontal region, the intrinsic and extrinsic muscles of the globe. and those accessory muscles which are called into play by the effort for accurate vision, such as the corrugator supercilii and occipito-frontalis, or serve to steady the head. Pain, weakness, paresthesia and cramp, the common symptoms of occupation neurosis, have their close analogies in ocular disturbances. Pain may be paroxysmal and may follow the occupation after an interval; theater migraine, for instance, developing next morning. Paresthesia is represented by a scotoma; cramp by ciliary spasm and various forms of lid-twitching. The hereditary tendency, especially among nervous, sensitively organized individuals, is compatable with this theory, as is the exciting factor of refraction error. This would account for migraine with low degrees of ametropia but marked psychopathic heredity. The pain of migraine is not necessarily intracranial, but is localized, in part, in the region of the muscles concerned, directly or indirectly, in vision. (In the discussion, Gradle, Wolfstein, and others called attention to the fact that there is frequently no ascertainable occupation strain or even refraction error in many of these cases, and that anemia, intestinal autointoxication, gout, lowered vitality, bad air and lack of exercise play an important part. A connection with epilepsy can be excluded. Scotoma scintillans is probably of central origin, and due to transitory vascular spasm). P. H. F.

ONE HUNDRED REFRACTION CASES IN INDIANS FRESH FROM THE PLAINS.—JONES, C. P., Newport News (*Jour. Am. Med. Ass'n.*, July 25, 1908). About 35 per cent. of aborigines admitted to Hampton Institute were found to have refraction error requiring glasses to improve vision or relieve eye strain. Of these, about two-thirds had hyperopia with or without astigmatism. Myopia was very rare. In the discussion it was noted that the reported remarkable eyesight of savages, sailors, hunters, and so on, has no relation to the refraction. Many of these individuals are ametropic and have sub-normal vision as tested by the optotypes, but keen sight for objects with which they are familiar. Visual association and intimate acquaintance with the environment account for these conditions as well as for many feats of markmanship. P. H. F.

Some Clinical Aspects of Lenticular Astigmatism.—Thomas, E. S., New York (*Jour. Am. Med. Ass'n.*, July 25, 1908). The determination of this important component depends at present on subtracting corneal astigmatism, as indicated by the ophthalmometer, from the total astigmatism shown by the shadow test under a cycloplegic. Lens astigmatism may be either static or dynamic, as shown by the compensation for low degrees of hyperopic corneal astigmatism, while similar degrees of myopic astigmatism are not neutralized by lenticular astigmatism, as the ciliary muscle is weaker, and accommodation has no effect in increasing acuity of vision for distance. Donders found astigmatism caused by tilting of the lens in his own eye, and head tilting and spectacle tilting indicate a like correcting factor, but aside from these exceptional cases dynamic lenticular astigmatism is probably caused by partial ciliary muscle contraction in the meridian of least refraction, and does not seem to occur after fifty. Lens tilting is probably due to gravity acting during relaxation of the zonule while the head is twisted, and appears only during accommodation. The finding of latent astigmatism under a cycloplegic is a strong point in favor of partial accommodation, as is the ability to overcome weak cylinders, invariably felt as a disagreeable strain. Persistent action of this factor could produce permanent lenticular astigmatism by irregular development of the ciliary muscle and by gradual change in the shape of the lens. In an intermediate stage, the lenticular compensates for the corneal astigmatism during accommodation only. After the age of 35 the compensating lens astigmatism is almost invariably static, and may amount to several dioptries. Tender spots in the ciliary region generally indicate irregular tonicity and consequent dynamic lenticular astigmatism, requiring examination under atropin. Over-correction of astigmatism should be carefully avoided. Simple astigmatism confined to the lens may be as high as one dioptre, is accompanied with severe symptoms, and is most frequent below the presbyopic age. Mydriasis is necessary in these cases as the lens astigmatism is most frequently due to faulty ciliary contraction. Small degrees of astigmatism are much more frequent with myopia than is usually supposed, and a similar condition of pseudo-myopic astigmatism may be caused by over-correction of hyperopic astigmatism by irregular ciliary muscle contraction. In the discussion it was noted that lenticular astigmatism could be observed by means of Purkinje's lens-reflexes seen through an ophthalmometer without prisms. Lens tilting can also be detected in this way, and irregular ciliary contraction can be shown by irregular dilatation of the pupil after minimal dose of atropin in the form of a gelatin disc placed in the conjunctival sac. P. H. F.

FORMULÆ EXPRESSING THE CONDITIONS OF REFRACTION AND THE OPTICAL ADJUSTMENT OF THE EYE.—STRAUB, M. (*Tydschr. v. Gen.*, March 30, 1907). used for years a simple formula for the optical adjustments of the eye. The conception of any case of refraction becomes easy for the one who understands the notions of diopter and emmetropia, particularly for the general practitioner. Emmetropia, the condition where parallel rays converge in the retina, being the ideal refraction, lies between hypermetropia and myopia. As for correction of myopia a negative lens is used, the error in the eye must evidently be positive; reversely for hypermetropia. The turning point between the two being emmetropia. the general formula for the two refractions are $E + n D$ (= myopia) and $E - n D$ (hypermetropia).

For the notation of astigmatism it is not necessary to indicate the refraction of the different meridians on the limbs of a cross; the formula is as intelligible, when both degrees of refraction are written one above the other, separated by a horizontal line and with a note indicating the direction of the meridian.

The formulæ state not only a degree of refraction but also every degree of optical adjustment of the eye. The adjustment is changed by trial and correcting glasses. It is convenient to use the formulæ for these adjustments. Thus the myopic adjustment $E + 2.5$ D. (obtained, whether by refraction, by the aid of accommodation or by trial glasses) that is convenient for a person with tolerable acuteness of vision, whose principal work is reading, and $E + 2$ D. that is required by a person who does manual work.

The formulæ also facilitate the demonstration of the equation for the amplitude of accommodation in the different refractive conditions. A scientific deduction can be made with Gullstrand's application of the lens formula, $-1/p_1 + 1/f = 1/p_2$ to the eye. The formula says that the divergence of the rays sent out by the retina (increased by the refractive index of the vitreous body). modified by the (physical) power of refraction of the eye, is equal to the convergence of the pencil directed from the eye to the farthest point. The convergence of this pencil is the ophthalmological refraction; it is nil in emmetropia, the degree of convergence of the rays is the measure of the myopia, of divergence of the hypermetropia. This convergence or divergence, measured in diopters and contrasted with parallel rays as the standard, gives our formulæ of refraction. E. E. B.

THE STUDY OF REFRACTION.—FOSTER, M. L., New York (*Ann. Ophthal.,* April, 1908). A perfect knowledge of the mathematical foundation of refraction and of optics is necessary; the use of drugs is necessary in a large percentage of cases to enable the examiner to determine the actual mathematical condition of the eye, but to place absolute adherence in mathematical or mechanical standards to the neglect of the modification produced by physiological activity is wrong. Such an adherence is practicable only in eyes which are naturally tolerant. In intolerant eyes an allowance must be made for the variation of the eyes from the mathematical standard induced by a factor the author can not define, but which seems to be inherent in the life of the tissue. Many cases of asthenopia, after glasses have been correctly fitted, are of psychic origin, many are cases or reflex irritation from the nose, or some internal organ. He pleads for less assertiveness with regard to our positions for and against the use of cycloplegics, and for more care and study of the physiology of intolerant eyes to the end that we can more surely afford them relief. M. B.

WHEN AND HOW SHALL WE USE CYCLOPLEGICS IN REFRACTION WORK?—DUANE, A., New York (*N. Y. State Jour. of Med.,* July, 1908), gives the following conclusions, based on long practical experience and a special series of tests:

1. A cycloplegic should be employed for determining the refraction in practically all cases, not glaucomatous, below 48 years of age and in some cases above this limit.
2. Homatropin in 2 per cent. solution, provided it is used with ordinary precaution, is a safe cycloplegic, and if properly used is effective in the vast majority of cases.
3. It should be repeatedly instilled and the examination made not less than an hour after the first instillation, nor until a test of the accommodation has shown that the latter is as completely abolished as possible.
4. The cases in which homatropin proves inefficient are few. They are marked by varying vision and varying acceptances, discrepancies between the subjective tests and the skiascopic findings, and the persistence of an undue amount of accommodation (more than one D) even after prolonged action and repeated instillations.
5. In such cases atropin should be used.

CHANGE OF REFRACTION DURING LIFE.—DUBOIS, H. F. (Doctorate thesis), found in the registers the examinations and re-examinations of the personnel of the state railways in the Netherlands, Gasthuis voor Ooglyder. From this material he could follow the refraction in different times of life of each case. The same method was always followed. The observations do not go further than the sixtieth year. The refraction of older persons was taken from the registers of the dispensary of the Nederlandsch Gasthuis voor Ooglyders, whenever a patient come in and for whatever cause, the refraction was determined. Statistics made in this way must give a clear idea of the refraction during life.

Dubois reaches the following conclusions:

It is a fact that the refraction of normal, emmetropic eyes changes in the course of years, so that the refraction diminishes and hypermetropia results. This change begins before the forty-fifth year, however small it may be. It is distinctly visible at the sixtieth year, when it is about 0.5 diopter. Then a little greater diminution of the refraction happens until the seventieth year, when the refraction has become about 1.5 diopters hypermetropic. Even after the seventieth year the hypermetropia often continues to increase; for the most part, however, it remains stationary from that time on. We do not know with certainty what causes the change of refraction in the emmetropic eye. In the lower degrees of hypermetropia (0.75 to 1.25 diopters) the diminution of refraction takes place as in emmetropia. In the average (1.5 to 3 diopters) and higher (> 3 diopters) degrees of hypermetropia at first a much greater and earlier increase of the hypermetropia appears, especially before the fiftieth year; after the sixtieth year they behave as the emmetrope until about the seventieth year, when an addition of 1 to 1.5 diopters, and then the refraction remains practically stationary. In the average degrees of hypermetropia the diminution of refraction is greater than in the high degrees. In the average degree a larger part of the total hypermetropia in youth is latent than in the high degree. The diminution of refraction, which occurs in the hypermetropic eye in the course of years, is partly due to a becoming manifest of the latent hypermetropia.

Dubois does not agree with Kouwenhoven (1899), who accepts two maxims in the diminution of the refraction, anyhow not for the emmetropes. It may be binding to a certain extent for the hypermetropes, who undergo a greater increase of their hypermetropia before their fiftieth year and another increase after their sixtieth year. Dubois' curve agrees pretty well with the well known one of Donders. The diminution of refraction begins also before the forty-fifth year; his curve between 60 and 70 years is steeper than that of Donders, where the line mounts regularly. Examination of more typical and extensive material than that over which Donders had demonstrates that his curve of the change of refraction in life represents the real relations, except for the later years of life.

Since 1877 the employés of the state railways have been examined by ophthalmologists before they enter the service; since 1883 re-examination is done at the forty-fifth year and each fifth consecutive year until the sixtieth year, which re-examinations are all done in the Nederlandsch Gasthuis voor Ooglyders. All determinations of the refraction are made with lenses without the use of mydriatics.

The average refraction of 377 eyes which were emmetropic in their younger years (about their thirtieth year) was:

H. 0.09 in < fortieth year, H. 0.20 in forty-fifth year, H. 0.32 in fiftieth year, H. 0.40 in fifty-fifth year, H. 0.55 in sixtieth year.

Fifty-six eyes had a hypermetropia of 0.75 to 1.25 diopters in younger years; these averaged at their fortieth year a H. of 0.97, at forty-fifth year a H. of 0.76, at fiftieth year a H. of 0.91, at fifty-fifth year a H. of 1.13 and at sixtieth year a H. of 1.39.

Six hundred and thirty-one eyes could be followed from youth to their fifty-fifth year and the same average refraction was found for these eyes, which were in youth emmetropic to hypermetropic 0.5 diopters, as in those which are described and could be followed until their sixtieth year: H 0.09 at < fortieth year, H. 0.19 at forty-fifth year, H. 0.30 at fiftieth year and H. 0.41 at fifty-fifth year.

Eighty-one eyes with a hypermetropia of 0.75 to 1.25 diopters at the average age of 30 years showed an average age of H. 0.97 at < fortieth year, H. 0.75 at forty-fifth year, H. 0.86 at fiftieth year and H. 1.05 at fifty-fifth year.

The slight decrease of hypermetropia in the forty-fifth year in both groups of hypermetropes may be due to the way of measuring, as in 1877 the old way was followed and many hypermetropes of 1/lx and 1/xl were found and scarcely any of 1/lxxx, and the refraction of these persons was very often found emmetropic or hypermetropic 0.5 diopter in their forty-fifth year and following years.

Of 821 eyes the refraction was determined every fifth year from their forty-fifth until sixtieth year; 632 eyes were emmetropic to hypermetropic 0.5 and had an average refraction in their forty-fifth year of H. 0.15; in fiftieth year H. 0.26; in fifty-fifth year H. 0.33; in sixtieth year H. 0.47.

It is undecided which of the two factors explain the senile hypermetropia: the loss of tonus of the ciliary muscle or a change of the lens. The only way is to have statistics as in this thesis, but where every determination of the refraction must be done before and after relaxation of the accommodation. This will show if really the static refraction of the eye changes, or that this change is only apparent, due to loss of accommodation. Dubois looks forward with pleasure for more light on this subject in the future. I think this should be done by the states. (Rev.) E. E. B.

## RETINA.

Blindness of the Macula from Local Deficiency of Circulation with Preservation of Function at the Fovea.—Polack (*Annales d'Oculistique,* March, 1908). It is known that the macula has a special vascular supply. Without large vessels, it is well supplied with blood by fine capillaries which converge toward its center in great numbers. Pathology demonstrates this in the case reported. It is that of a mechanic, 32 years of age, without hereditary taint. He had suffered with convulsions in infancy and was poorly nourished, and between 15 and 20 had frequent attacks of migraine.

He complained of impairment of sight in the right eye, which had commenced eight years before after a severe attack of grippe accompanied with violent headache. While at work he felt a shock in the eye, and when the other was closed a dark spot obscured the vision. On August 18 V. = 8/x and on August 25 it was full, but the patient still complained of the dark spot and that he could see only with direct fixation, the object disappearing on the slightest movement of the visual axis. He had great difficulty in finding the line of letters when it was lost.

The scotoma occupied the whole macula except a very small central region and had the form of an oval with the long axis horizontal. The visual spot was outside of and a little below the center of the oval, corresponding to the fovea.

Placed at five meters from the test card of Monoyer, the patient could see on the last line only two letters without moving the eye. This represented an interval of 33 mm., and gave 100 microns for the horizontal diameter of the region functionally intact: and calculation also showed that the scotoma measured 25 mm. in the vertical diameter and 3 mm. in the horizontal, or 4 mm. including the relative part of the scotoma.

The ophthalmoscope showed that the macular and perimacular regions were deprived of retinal vessels. The branches of the papillomacular artery were extremely narrow and sent no capillaries in the direction of the macula. Otherwise the appearance of the macula was normal. The papillæ of both eyes presented slightly blurred margins showing former neuritis, and in that of the right eye there was an abnormal paleness of the temporal segment.

The author thinks it probable that the patient had had, eight years before, a post-grippal optic neuritis, and that the monolateral character of the resulting vision defect was due to the anatomical disposition of the maculo-papillary artery of the right eye which arose behind the papilla and emerged near the border, a course which would make it more subject to pressure.

The conservation of the function of the fovea is explained by the fact that it gets its nourishment from the chorioidal vessels.

G. C. H.

CONTRIBUTION TO THE KNOWLEDGE OF UNILATERAL RETINITIS PIGMENTOSA.—REUTER, HANS (From the eye clinic of Prof. Carl Hess in the University of Wuerzburg. *Archiv fuer Augenheilkunde,* lx, 1, 1908, p. 59). Unilateral retinitis pigmentosa, not due to syphilis, is, according to Leber, extremely rare, relatively more frequent if of syphilitic origin. Out of eight cases, collected by Reuter from literature, in four signs of lues had preceded or were still present, in two nothing was said of syphilitic symptoms, and only in two syphilis was excluded.

Reuter reports another case of unilateral retinitis pigmentosa after luetic infection. The left eye of a man, aged 65, represented the characteristic changes of retinitis pigmentosa with yellow atrophy of the disc. V. = 0. His vision was good until 1882, when he came to the clinic for an inflammation of his left eye. It then showed old posterior synechiæ, recent irritation of iris, no ophthalmoscopic changes. Six years previously he had been at the hospital for six months on account of a venereal infection. In 1899 pigment changes, narrowing of the blood vessels, pallor of the disc, and considerable contraction of the visual field were ascertained. In 1901 he could only see a white square of 10 cm. at 15 cm. paracentrally, and now the eye was totally blind. As in the other cases mentioned, the disease took a much more rapid course than the common bilateral retinitis pigmentosa. C. Z.

Experimental Investigations on Albuminuric Retinitis.—Shiba, S, Osaka, Japan (*Klinische Monatsblaetter fuer Augenheilkunde*, xlvi 1, p. 387), produced parenchymatous nephritis by injecting into both kidneys of rabbits and cats, after exposing them according to surgical rules, tincture of iodin, three times diluted with alcohol. One drop was injected deeply into the parenchyma of the upper, one into the middle and one into the lower parts of the kidneys. Numerous animals succumbed after the injection. In 9 out of 13 experiments the animals lived longer than two days and could be examined ophthalmoscopically. In 6 out of these 9 cases (66.6 per cent.) the enucleated globes showed marked miscroscopic changes of the retina. This corresponds with the statistics of Elschnig, who examined systematically the eyes of 199 cases of nephritis and found retinitic changes in 63. The changes in the six cases of Shiba, which are described in detail, consisted in edematous loosening of the inner layers of the retina, with subsequent alterations of the ganglion cells and the inner granules. Two cases were complicated by detachment of the retina. In the detached portions of the retina the cones and rods were converted into globular masses, the pigment epithelium remained partly on the chorioid, or was found in the exudation, or destroyed. The exterior granules were also changed in structure and position. No alterations of the blood vessels were observed, most likely on account of the brief duration of life after the injection.

Hence, Shiba concludes that in nephritis changes of the retina occur before the development of histologic mutations of the blood vessels. He thinks that the direct cause of the retinal changes is primarily to be attributed to the condition of the blood. The detachment of the retina was apparently due to exudations from the chorioid. No fatty degeneration of the retinal elements could be ascertained. The possible dependence of the retinal changes upon intoxication from the injected substance could be excluded, as three cases remained free from alterations of the retina, although they showed marked nephritis. The anatomical aspect of Shiba's cases was entirely different from that obtained by Birch-Hirschfeld, who observed after large quantities of alcohol, alterations of the ganglion cells of the whole retina. C. Z.

## SINUSES AND NOSE.

The Participation of the Ophthalmologist in the Operative Treatment of the Orbital Accessory Sinus.—Axenfeld, Th., Freiburg i. Br. (*Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 1, 1908, p. 506), shows on a variety of cases that the ophthalmologist who wishes to do orbital surgery within not too narrow limits must be familiar with the operative treatment of the accessory sinus in order to be able to effectually meet all kinds of possible contingencies. C. Z.

SURGICAL TREATMENT OF ORBITAL COMPLICATIONS IN DISEASE OF THE NASAL ACCESSORY SINUSES.—KNAPP, ARNOLD, New York (*Jour. Am. Med. Ass'n.*, July 25, 1908), refers to subperiosteal abscess. The extension of the infection to the orbit generally takes place by way of the os planum of the ethmoid. In case of sudden perforation the symptoms are those of an acute abscess with cellulitis, going on to spontaneous discharge or subsiding with intranasal treatment. A purulent sinus may persist leading into the frontal or ethmoid cells. In gradual perforation there is generally more extensive destruction of the bony wall, forming a large abscess cavity and producing marked exophthalmos, for which the patients seek relief. In children the acute perforation takes place through the ethmoid plate. In the operation for this condition Knapp finds it a distinct advantage to remove the anterior half of the middle turbinate a day or two before operation. The incision is made midway between the eyebrow and the orbital margin and carried well down along the nasal side of the orbit. The orbital periosteum is detached, carrying the soft parts with it and preventing injury to the trochlea and subsequent paralysis of the superior oblique. The pulley is best detached from the trochlear fossa with a blunt periosteotome working from behind forward. The entire floor of the frontal sinus is then removed with chisel and mallet, the diseased mucous membrane curetted, and the bony septa eradicated. The nasal process of the superior maxillary, the lacrimal bone, and the ethmoidal os planum are then resected, giving wide access to the middle meatus and to the ethmoid labyrinth, which is completely resected in case the sinus extends high up. The anterior ethmoidal foramen is a landmark as one works backward at the nasal side, indicating the base of the skull, and the ethmoid becomes broader laterally. The remaining part of the middle turbinate may now be removed if necessary, and the sphenoid sinus entered. This is facilitated by introducing a finger into the nose as a guide. The final curetting of the ethmoid is best done with the head low down and when the patient has partly revived from narcosis. The wound is drained into the nose and externally, but not sutured. In case of broad access from below, window resection of the anterior wall is not necessary. The ophthalmic surgeon should be prepared to continue the development of this important field. P. H. F.

Exophthalmos of Three Years' Duration Cured By Removal of the Middle Turbinated Body.—Johnston, R. H., Baltimore (*Ophthalmic Record*, July, 1908). Miss McK., aged 17, had suffered for three years with recurring monocular exophthalmos whenever she had a cold, and finally the exophthalmos became permanent. Intranasal examination showed nothing except an enlarged middle turbinated body. The anterior end of this was removed and the removal attended with a gush of a half ounce of greenish pus. The exophthalmos gradually decreased and in about six weeks the eye was normal. M. B.

## SYMPATHETIC OPHTHALMITIS.

Sympathetic Ophthalmia.—Brose, L. D., Evansville, Ind. (*The Lancet-Clinic,* July 18, 1908), warns general practitioners against mistaking simple sympathetic irritation for sympathetic ophthalmia. Sympathetic irritation is characterized by photophobia, blepharospasm, increased flow of tears, injection of the blood vessels in front of the eyeball, accommodative asthenopia, neuralgic pain in the distribution of the supraorbital nerve, with at times retinal asthenopia and contraction of the field of vision. It is not only a frequent accompaniment of sympathetic ophthalmia, but it is likewise a prodromal symptom of much value in arriving at an early diagnosis of it. Three clinical types of the disease are described: (1) Iridocyclitis of a proliferative and adhesive nature; (2) serous iritis, characterized by slight pericorneal redness, turbidity of the aqueous humor and anterior portion of the vitreous, deepening of the anterior chamber, with punctate dot-like deposits triangularly arranged upon the posterior surface of the cornea; (3) papilla retinitis, in which the outlines of the optic disc are obscured, with edema of the adjacent retina. This type is rare. The onset may be so insidious that the eye may become blind with but little suffering. The author records three cases. He believes that a toxin forms in the injured eye and makes its way to the sympathizing eye either through the blood vessels or the lymphatics. As to prophylactic enucleation, the author states the rules laid down by Dr. de Schweinitz. He urges strongly not to enucleate the injured eye so long as it retains vision, as it may possibly prove the more useful of the two eyes. He recommends confinement to a darkened room, atropia instillations as long as the pupil will react to a mydriatic. hot compresses, inunctions of mercury, aspirin and salicylate of soda. For the relief of intraocular tension dionin may be used with morphia hypodermically. A sclerotomy might be advisable. M. D. S.

A Suggestion as to the Treatment of Sympathetic Iridocyclitis, Pathology of the Uvea or Tractus Uvealis.—Borghetti. E., New Zealand (*Ann. Ophthal.,* April, 1908). His procedure is operative. The first day, a sclerocorneal incision is made with a Graefe knife on each side, leaving a bridge of cornea above and below. The iris is cut all along this incision close to its base, leaving a bit of it at the top and bottom. The lens is now needled or its elements disintegrated by pressure. The next day the capsule is removed and the lens is removed by suction. An illustrative case is reported. M. B.

## TOXICOLOGY.

Tobacco and the Eyes.—Dowling. Francis. Cincinnati (*The Lancet-Clinic,* June 13, 1908), says that of all the toxic amblyopias. that produced by tobacco is the most prominent and frequent. A number of cases are recorded and the results of examinations of a large number of employés in cigar factories and tobacco warehouses are given. The negro race seems immune from tobacco blindness. The majority of those examined had contracted pupils. most marked in those having strong evidence of tobacco infection. The usual sufferers are males between the ages of 35 and 68 years. There is almost always a gradual but progressive failure of visual acuteness in both eyes. Luminous objects dazzle the eyesight, and these patients see better in the evening than in the middle of the day. The ophthalmoscopic examination of the eyes reveals the papilla of the optic nerve to be more than usually red in the early part of the affection. Later it appears anemic, especially on the temporal half, and finally atrophy of the disc takes place. He says these changes in the papilla are probably caused by direct action of the nicotin, which enters the circulation. The prognosis is good if the case is taken early, sometimes complete recovery occurring. and always improvement. From 6 to 12 weeks' treatment are usually necessary. Tobacco and alcoholic drinks are forbidden. The antagonism between nicotin and strychnin has made the latter valuable in the treatment of this disease. M. D. S.

Amaurosis Due to Filix Mas.—Schoening. Dr. (From the eye clinic of Prof. H. Kuhnt in the University of Bonn. *Zeitschrift fuer Augenheilkunde.* xix, 1908, p. 233). gives a review on the incident literature, which shows, out of 81 intoxications after rhizoma filicis, 12 deaths, 19 bilateral permanent, 15 unilateral permanent amauroses, 7 cases of bilateral, 4 of unilateral impairment of vision, 2 transient visual disturbances. A new case is reported in detail which presented the following remarkable features: The patient was not anemic, but a very robust young man of healthy appearance. No preparatory weakening cure had been employed, nor afterward castor oil. The toleration of a former anthelmintic treatment proved that there was no idiosyncrasy. Seven hours after the visual disturbances had set in, ophthalmoscopic changes were noticeable: narrowed arteries, enlarged veins and corrugation of the retina, most likely from edema. The first return of perception of light occurred at the periphery (not in the center, which Nieden mentions as the rule) of the left eye a fortnight after the blindness had commenced. C. Z.

Toxic Symptoms Following the Instillation of Homatropin Hydrobromate.—Le Fevre, Charles, Philadelphia (*Ophthalmic Record*, June, 1908). During an examination for refraction, a woman of 35 had a 2 per cent. solution homatropin instilled in each eye four times during a period of two hours and twenty minutes. She then became light headed, throat was dry, voice became thick, was irrational, with hallucinations of sight and hearing, muscular prostration and incoordination, etc. Recovery in seven hours time. M. B.

A Case of Quinin Amaurosis.—Williams, Carl, Philadelphia (*Ann. Ophthal.*, January, 1908). A young woman of 20 took 80 grains of quinin, which caused stupor, nausea and vomiting, followed by blindness. Vision gradually returned, and when seen by the author two years later it was 6/ix in each eye, with marked contraction of the fields. Glasses were prescribed for hyperopia. She complained of poor vision when the illumination was poor. She was seen again four years later, when vision was found to be 6/vi.

Fields contracted, light sense taken with De Wecker's photometric charts = 3/x for each eye. The discs were white gray in color, lamina cribrosa plainly seen; retinal vessels smaller than normal. M. B.

Argyrosis of the Conjunctiva in General Argyrosis.—Sommer, Mayen (*Woch. f. Therap. u. Hyg. des Aug.*, June 11, 1908), stimulated by a recent statement that there is in literature nothing as to whether, and how, the eye participates in general argyrosis, recalls a man who was repeatedly his vis à vis neighbor at the dining table who had been treated with silver for tabes. The skin of the face and hands had the typical dirty blue-gray diffuse, but somewhat uneven coloration. The conjunctiva had the characteristic appearance that this membrane assumes in local argyrosis; the coloration was, however, much less intense.

W. Z.

## TRACHOMA.

Investigations on the Origin and Development of Trachoma.—Prof. Greeff, Prof. Frosch and Dr. Clausen, Berlin (*Arch. Ophthal.*, N. Y., July, 1908, xxxvii, 406. Abridged Translation by Dr. Arnold Knapp). Greeff calls attention to the fact that during the past ten years no advance has been made in the clinical aspect of trachoma and he believes that we will not obtain any additional light on this disease until its cause is known. The author has devoted the last ten years to a scientific investigation of trachoma and has concluded that with our present methods the organism of trachoma can not be demonstrated. The author has investigated the analogy between syphilis and trachoma and has not determined that any relationship exists.

Frosch and Clausen, in an examination of a large number of trachoma cases found small diplo-bacteria present in the discharge and in the follicle contents. They successfully inoculated the human conjunctiva with material from trachomatous eyes. Inoculation of rabbits, guinea-pigs and dogs was negative, but the authors successfully inoculated anthropomorphic apes, producing a purulent conjunctivitis without the presence of trachoma follicles.

W. R. M.

Secondary (Parenchymatous) Xerosis.—Herbert, Lieut.-Col. H., India (Report of June, 1908. Meeting of the Ophthalmological Society of the United Kingdom. *Medical Press,* June 17, 1908). The writer drew attention to the part played by pannus in the development of xerosis after trachoma, and pointed out that old pannus rendered the corneal surface insensitive. Hence, with both corneas covered with pannus, the blinking movements of the lids tended to be imperfect, and thus led to exposure of the globe. This appeared to be an important factor in the dryness which followed: for in such cases xerosis of the cornea and conjunctiva was often very marked when the cicatricial degeneration of the conjunctiva was much less advanced than in other old trachomatous cases in which the eyes remained moist and the corneas clear. The exposure of the cornea rendered it more opaque and insensitive, so that the blinking movements might amount to only very infrequent and slight twitches of the lids. Similarly inactive lids were seen in India in a few cases of severe primary (epithelial) xerosis. In these cases the exposed cornea became not only opaque, but pigmented, like the degenerate conjunctiva. Here the primarily defective reflex action of the lids seemed to be attributable to malnutrition only. Another factor in the production of cicatricial xerosis was the reduced transudation of fluid from the palpebral conjunctiva. If the upper lid were everted in any case of ordinary acute conjunctivitis, a free flow of watery fluid was readily demonstrable from the exposed conjunctiva. But a similar flow was not obtainable from a cirrhosed or cicatricial conjunctiva, however much inflammation might be present. C. H. M.

## TUMORS.

A Case of Carcinoma of the Eyelid with Xeroderma Pigmentosum.—Cuperus, N. J. (*Tydschr. v. Gen.*, Jan. 26, 1907). treated a girl, 10 years old, for a tumor of the right face. At birth the child was remarkably delicate, her general development was stunted. A skin disease began at the age of 3 or 4 years, with many brown patches, which became thicker and redder; it began in the summer. Later the skin became thinner, the brown patches remained, here and there also small warts. In later years red tumors above the eyes (ectopian palpebræ superioris) arose; the one above the right eye was only of two months' duration. No skin affection among the other members of the family (parents and eight children, oldest 23, youngest 6 years), neither carcinoma among older relatives.

The girl is very emaciated. The skin of the dorsum manus, face, throat and neck is atrophic and tense, with many patches like freckles, alternating with cicatricial patches void of pigment, in which here and there telangiectasies, also little knobs and warts are seen. Only the palms of the hands and feet are normal. The most remarkable part, however, is the loathsome darkly colored flat and soft tumor, lobulated with deep fissures; blood oozes constantly with pus, a nauseous fetor is present. The tumor starts from near the hair-border and extends to the angle of the mouth and right ear and over the nose, covering nearly the right face, but only in contact with the underlying tissue over the right eye. The point of the right ala nasi has also a tumor of the size of a hazelnut. No metastases. Temperature evenings above 39°.

*Diagnosis.*—O. S., ectropion palpebræ superioris, swollen conjunctiva, eye looks normal. The ectropion is apparently due to shriveling of the skin. O. D., carcinoma of the upper eyelid in connection with xeroderma pigmentosum.

Professor Reddingius examined microscopically the tumor and found irregular epithelial cell strands separated by narrow streaks of connective tissue, rich with nuclei and small cells. In the cell-nests much necrosis. Many cellforms are very irregular. Very many karyokineses, but few regular ones. Also gigantic nuclear bodies: through variability a very strange picture. A few chromatophores (Ribbert). The tissue is colored yellow or yellow-brown grains.

The tumor was removed with knife and paquelin. A connection only existed with the upper eyelid and superior orbital margin, the tumor was very friable, 3 to 4 cm. thick. The periosteum along the orbital margin was thickened and the periorbital tissue at the upper side infiltrated. The operation was well borne, temperature became 37.1°. During the following days an ulcus corneæ cum hypopio appeared in the right uncovered eye. The eye was lost by panophthalmitis. The general condition improved. After a few weeks a soft tumor developed on the right forehead, the tumor at the right ala nasi grew quickly. A month after the operation patient left the hospital and was taken care of by her family physician, who reported that within three months another tumor of the size of a fist had developed over the right eye; general condition bad.

E. E. B.

MELANOTIC EPITHELIOMA OF CARUNCLE.—AURAND (*Revue Generale d'Ophtalmologique,* April 30, 1908). Tumors of the caruncle are rare and epitheliomata more so. Of melanotic epitheliomata but one other case besides that which Aurand now reports has been published. The first was Despagnet's, recorded in 1888. Aurand's case was in a man 32 years old, in whose left caruncle existed the neoplasm. The growth was examined microscopically and its histologic make-up is given in detail by the author.

B. E. F.

SUB-PTERYGIUM CYST: HISTOLOGIC EXAMINATION.—TRUC and BONNET (*Revue Generale d'Ophtalmoligie,* March 31, 1908). The authors state that sub-pterygial cysts are rare. In the case they report there was a pterygium on each eye, that of the left was quite voluminous. The histologic examination demonstrated that the so-called cyst was in fact an infolding of the conjunctival epithelium into the pterygial body. B. E. F.

LIPOMATA AND DERMO-LIPOMATA OF THE CONJUNCTIVA.—ROCHAT (*Tydschr. v. Gen.,* Jan. 26. 1907), refers to the opinion of the majority of writers, who consider the so-called lipomata to be dermoid tumors. He shows a series with different varieties. First, the typical dermoid tumor in a child 6 weeks old: a small white tumor, round at the temporal side of the cornea riding on the limbus. The tumor looked like a piece of skin with numerous hairs. Microscopically it contained elements of the skin: a layer of pavement epithelium with underlying connective tissue with hairs and fat glands are found. These dermoids may appear at the nasal side and further from the cornea. The cause may be a growing together of the surface of the eye with the amnion. Second, dermoid of the conjunctiva with endobulbar lipoma. Rochat had seen this case in Fuchs' clinic; it is described by Hanke in V. Graefe's *Archiv.,* Bd. 57. Third, lipo-dermoid of the conjunctiva. The specimen came from a child 4 months old, which, according to the history, had "polypi" in both eyes, which the family physician had snared off. A large tumor to the lateral side of the limbus of the left eye was present, which extended backward over the sclera. Opacities at the limbus in both eyes could be the results of previously removed tumors, as dermoids sometimes appear multiple in the conjunctiva. Microscopically the tumor consists of fat-tissue covered by a thick layer of skin, which is not exactly like the external skin as in the typical dermoid, but contains a thick connective tissue layer with pavement epithelium without stratification. Hairs and glands were absent in the coupes. Formerly such tumors were called subconjunctival lipoma, but careful investigation of a number of them showed that nearly always a few hair-follicles or fat-glands can be found, which demonstrate their true nature. These lipo-dermoids can not be enucleated in their entirety from the conjunctiva, but a more or less intimate connection exists between the tumor and its covering, so that this has to follow in the extirpation. Fourth, also a lipo-dermoid similar to the foregoing. It showed the clinical picture of what was formerly called lipoma conjunctivæ: a yellow tumor in the lateral upper part of the ocular slit upon the sclera: the place of election for lipomata. The 14 years old patient had noticed the tumor for half a year; also here the tumor could not be separated in its central part from the conjunctiva: this part has an uneven surface with papillæ. Fifth, a 60 years old lady noticed some months a yellow sausage-like tumor in the lateral half of the inferior fornix, which protruded the lower lid somewhat. The conjunctiva over the tumor was movable and the tumor itself was movable. The largest part of the tumor was deep and on the side of the bulb. Microscopically only fat-cells with connective tissue septa. It may be that this is a true lipoma originating in the orbital-fat. This opinion is corroborated by findings in a number of persons, an indication of such a lipoma formation; it is found in elderly people on pushing the underlid downward. In one case harelip was present. For the rest no colobomata nor any other congenital defect existed.

E. E. B.

A CASE OF CAVERNOUS LYMPHANGIOMA OF THE ORBIT.—FEHR, Berlin (*Centralblatt fuer praktische Augenheilkunde,* 1908, p. 134). A woman, aged 45, noticed, one and one-half years ago. a slight protrusion of her right eye, which gradually increased. Then pain in head and eye and deterioration of vision developed. On admission into the hospital the right eye showed a protrusion directly forward, of 12 mm. hypermetropia and papillitis, from which Fehr made the diagnosis of retrobulbar tumor in the muscular funnel. At the operation, according to Kroenlein, a cavernous lymphangioma of the size of a plum at the temporal side of the optic nerve was found and bluntly removed, with perfect recovery.

Fehr emphasizes that this is the first case of a deep seated cavernous lymphangioma, which was cured without functional disturbance. He also describes his simple method of exophthalmometry with the ophthalmometer, which has not been mentioned in the treatises of Landolt and Birch-Hirschfeld in the new edition of the handbook of Graefe-Saemisch. C. Z.

TUMOR OF THE IRIS, EXISTING FOR TWENTY-TWO YEARS.—GROENOUW, A., Breslau (*Centralblatt fuer praktische Augenheilkunde,* 1908, p. 101). The left eye of a man, aged 41, presented, in the lower temporal sinus, a brown tumor of the iris, 6 mm. long, 3 mm. wide, without other changes of the iris. The refracting media were clear, the optic nerve excavated, vision reduced to perception of light. The patient had noticed the tumor twenty-two years ago, when it had exactly the same dimensions, according to the records of an ophthalmic surgeon, and vision with a cylinder, = 6/v. It could not be ascertained whether the tumor had existed even longer, perhaps from birth on. It caused no disturbances until five years ago, when the eye gradually grew blind without inflammatory symptoms.

From similar cases from literature, of which a short review is given, Groenouw considered it either as a very slowly growing melanosarcoma or as a melanoma existing over twenty years which became sarcomatous within the last few years. Most likely an early removal of the tumor by iridectomy would, on account of its benign character, have effected a cure with preservation of sight, although in general enucleation of the eyeball is given preference by various authors, as sometimes besides the original tumor, metastatic nodules may occur in the iris, which remain after iridectomy and cause relapses. C. Z.

Case of Melanosarcoma of the Orbit.—McConnell, G. and Burman, R., St. Louis (*Boston Med. and Surg. Jour.*, July 23. 1908). Melanotic sarcoma of the orbit is usually supposed to be very rapid in growth. In this case, that of a man of 64, there was an interval of nearly eight years between the first indication of trouble and the death of the patient. After the first operation (enucleation) the growth remained apparently quiescent for a number of years, beginning to proliferate only after there had been irritation from an artificial eye, evidently acting as a foreign body. After the second operation in which masses were removed from the orbit, the sarcoma grew rapidly and the patient soon died of metastases in the liver. This organ was greatly enlarged. not so much by tumor masses, which were numerous but not very bulky, as by proliferation of bile ducts and of connective tissue. Microscopically this secondary epithelial proliferation resembled that of a diffuse malignant adenoma and would have been so diagnosed in the absence of clinical and pathological history, but the pigmented sarcoma deposits indicated their real nature. P. H. F.

A Case of Sarcoma of the Right Orbit.—Muetze, Henry, St. Louis (*Ann. Ophthal.*, April 1908). A rapidly recurring tumor in the region of the inner canthus in a boy of 13 years, who was three months previously struck in this eye with a ball. After two removals the tumor recurred in the depth of the orbit requiring complete exenteration of the orbit. The reports from pathologist were small round cell sarcoma. M. B.

Probable Tumor of Pituitary Body with Optic Atrophy, Following Premature Menopause.—Wylie, Ella R. (*Ophthal-*

*mic Record*, May, 1908). A woman of 26 years, who ceased to menstruate at the age of 24 presented symptoms of double optic atrophy with vision, O. D. p. l, O. C. 4/v. No symptoms of lues, myxedema or acromegaly. She was placed upon iron and strychnia, alternating with the iodids. Vision came up to normal in left and remained so for several months. She then tried Christian Science to regain vision of right eye, and stopped her former treatment. Within a few months the vision of left eye failed and she died finally from a supposed tumor of pituitary body. No autopsy.

M. B.

## UVEAL TRACT.

Indications for Iridectomy in Irido-Chorioiditis.—Farid, Nasr, Mansourah, Egypt (*Ophthalmoscope*, May, 1908). A man of 55, with syphilis, developed irido-chorioiditis, and despite active treatment the vision went down to 1/x in one eye and almost nothing in the other. After an iridectomy had been performed on each eye, the vision, in three months, came up to 1/viii and 1/iii.

M. B.

## VISION AND COLOR VISION.

The Color Sense.—Wadsworth, Wm. S., Philadelphia (*Ann. Ophthal.*, January, 1908), believes that the influence of color upon the human race is very important. So completely is color sense woven into every part of our lives that any change of the ordinary color of any object will entirely alter the personal attitude. So absolute is the color domination of our lives that the effect of a sudden change of colors of all objects about us produces the most amazing subjective results. Given a normal man in average health under definite conditions, time of day, digestion and fatigue, and a color will have a fairly fixed value to him; if it does not the man is not normal in his color sense. M. B.

A Case of Acquired Color Blindness and Its Bearing on Theories of Color Perception.—Best, Professor (*Scientific American Supplement*, April 11, 1908), records the case of a physician, who, after wandering two days over snow-clad mountains, acquired a color blindness which systematic tests showed to be precisely the same as congenital green color blindness with shortening of the spectrum at the red end. He believes that the Young-Helmholz theory of color perception, assuming that the eye contains constituents of three kinds affected by different length waves of the spectrum, does not account for the case, but that Hering's contrast theory of color perception assuming the existence of two pairs of complementary color sensations, red-green and yellow-blue, each of which pairs produces white by the combination of its two components, seems much more likely. M. D. S.

MEASUREMENT OF STEREOSCOPIC VISUAL ACUITY.—JAMES, G. T. B., Southwark (*Lancet,* June 20, 1908), has devised a stereoscopic box for use at a distance of 6 meters. The test objects are two sticks of unequal distances from the eyes, but of apparently equal size, the binocular parallel alone being made use of for their recognition, as no shadows are cast owing to uniform illumination, linear perspective is excluded by hiding the extremities of the sticks, and the distance at which the test is made excludes the possibility of parallax due to slight movements of the head and any effect of accommodation. Lack of keen binocular vision will be indicated by inability to appreciate the relative distance of the test objects. With an interpupillary distance or base line of 60 mm. and with one stick 180 mm. behind the other, the angle of the stereoscopic parallax is 1 degree, exactly the same angle as that subtended by each line of the letters in the 20/xx row of Snellen's optotypes. We can infer that a patient who can distinguish the relative distance of the sticks must have a visual acuity of 20/xx. James has constructed a series of tables showing the required separation of the test-objects for various interpupillary distances from 50 mm. to 70 mm., the separation necessary with various degrees of visual acuity, and the various distances from the stereoscope at which the parallax is appreciated with gradually diminished vision. The eyes are first tested separately, when the test objects will appear to be at one and the same distance from the patient, and then together, when the difference in distance will become appreciable to normal binocular vision. The stereoscopic box is about fifteen inches long, and has a window eight inches long. It is lined with black velvet and illuminated from the inside. P. H. F.

FIVE ADDITIONAL CASES OF SERIOUS VISUAL DEFICIENCY AFFECTING RESPONSIBLE EMPLOYES IN THE MARINE AND RAILWAY SERVICES.—GALLOWAY, A. RUDOLPH, Aberdeen (*Ophthalmoscope,* May, 1908). These men are at the present time all holding responsible positions, and are all unsafe, either because of an error of refraction which greatly lowers distance vision, or of color-blindness. They have been examined by lay inspectors and passed. The author believes that men seeking positions of responsibility should be examined by medical men. M. B.

## VISUAL FIELD.

Report of a Case of Right Homonymous Hemianopsia in the Macular Regions—Posey, Wm. Campbell, Philadelphia (*Ophthalmic Record,* May, 1908). A man of 56 years complained of confusion of mind and speech with dizziness, followed in a few days by inability to see all of a word when reading. The word was blurred toward the right. No difficulty with distance vision. An examination of his fields showed them to be normal in outline but defective downward and to the right for a small area from the fixation point. During three years the condition has not improved. The author quotes at some length from Wilbrand, Mills and others.

M. B.

## VITREOUS.

Recurrent Hemorrhages Into the Vitreous Humor Occurring in Adolescence.—Krauss, Frederick, Philadelphia (*Ann. Ophthal.,* January, 1908), reports the case of a man of 26 years , who, during two and a half years had six hemorrhages into the vitreous. Each attack was attended with great reduction in vision, with subsequent rapid visual return to normal. Distinct spots of chorioiditis were found after the absorption of the first hemorrhage, and these spots grew larger after other hemorrhages. No findings are given regarding his blood tension. The author believes that chronic constipation, and resulting intestinal toxemia result in sudden alterations in blood pressure, and to the latter we must look for the causation. M. B.

## *Book Reviews.*

**The Development of Ophthalmology in America, 1800 to 1870.** HUBBELL, ALVIN A., M.D., Ph.D., Professor of Clinical Ophthalmology in the University of Buffalo, etc., Buffalo, N. Y. W. T. Keener & Co., Chicago. Price, $1.75 net.

Dr. Hubbell has given us in his new book a comprehensive and most delightful Ophthalmologic History and Biography.

The American pioneers in our chosen field receive their due recognition and are presented to us as an inspiration and stimulant to greater efforts. The portraits and cuts of these men bring them home to us with more emphasis and we begin to know and appreciate the legacy they have given us.

The origin and development of American ophthalmological institutions are treated in a most interesting manner. The instruments and operations of the time are also given their share in this work. On the whole it would seem that an ophthalmologist's library would be incomplete without a copy of Dr. Hubbell's "Ophthalmology in America from 1800 to 1870," and the reviewer heartily recommends this volume for your perusal.

GUSTAVUS I. HOGUE.

**The Muscles of the Eye.** HOWE, LUCIEN, M.A., M.D., Professor of Ophthalmology, University of Buffalo, Member of the Royal College of Surgeons of England; Member of the Ophthalmologische Gesellschaft, of the Societe Francaise D'Ophthalmologue, and of the Ophthalmological Society of the United Kingdom; Former Chairman, Section on Ophthalmology, American Medical Association. Illustrated. Volume ii. G. P. Putnam's Sons, New York and London. 1908.

With the completion of the second volume of 463 pages on the ocular muscles, Howe has covered the subject in a most thorough manner and has brought the confusing data concerning heterophoria and strabismus into a natural and scientific arrangement. These two books are in effect a monograph, which shows a most exhaustive study of the subject and yet brings the most salient points to the notice of the student. In this volume he takes up the pathology and treatment of ocular muscle imbalance, giving considerable space to accommodation; then he goes on to the description of the heterophorias and the study of torsion; taking up the subject of compound imbalance, he credits the effects of the ocular muscle of the eye to all neighboring structures and indirectly all parts of the body are discussed: reflexes to the eye from disturbance in other parts of the body are taken up.

Part II, On Deviations Due to Lesions in the Extra-ocular Muscle or in the Globe. Part III, Deviations Due to Lesions in the Brain or in the Nerves (The Paralyses). Part IV, Atypical Movements. Inflammations and Injuries of the Muscle. Part V. Operations on the Muscles. In the appendix he gives a bibliography, questions for study. a list of ophthalmological periodicals in some English libraries, an index of authors and subjects and biographic notes of a few eminent students of the ocular muscles.

A distinctive feature of the volume is that the author deals with facts rather than theories, and the arrangement of the facts is new. He shows how much careful consideration should be given to this class of cases, but facilitates their study by additional methods of diagnosis, by new instruments for measurement (an optometer, strabometer, amblyopia scale, etc.) by new instruments for operation, and improvements of earlier procedures.

The book is beautifully bound and is commended for any exhaustive study of the subject. H. V. WÜRDEMANN.

**Diseases of the Eye.**—MAYOU, M. STEPHEN, F.R.C.S., Late Hunterian Professor, Assistant Surgeon and Pathologist Central London Ophthalmic Hospital, etc. Illustrated. Price, $1.25. Oxford University Press. 1908.

This is a very elementary pocket book in octavo form, with flexible covers, well printed and illustrated, written by the author with the object of presenting to students who are beginning the subject and to practitioners a short practical manual on diseases of the eye. As such the little work is well adapted to the purpose and has been brought up to date. Naturally in such a compilation the descriptions are extremely brief and dogmatic, but, as the author says, "it is better for a beginner to have a knowledge of one matter or theory than a confusing smattering of several."

The illustrations are original and are especially good for work of this class. The appendix containing prescriptions frequently used in ophthalmic medicine, an abstract of vision requirements for the British public service, the navy, army, Indian Service and Public Works, together with a complete index, is appended. The book is recommended for under-graduate students.

H. V. WÜRDEMANN.

**Manual of Ophthalmic Surgery and Medicine.**—JESSOP, WALTER H. H., M.A., M.B. Cantab., F.R.C.S., Eng., Senior Ophthalmic Surgeon to and Lecturer on Ophthalmic Medicine and Surgery at St. Bartholomew's Hospital; Ophthalmic Surgeon to the Foundling Hospital; Consulting Ophthalmic Surgeon to the Paddington Green Children's Hospital; Hunterian Professor, Royal College of Surgeons, 1887-88. Illustrated. Price, $3.80 net. P. Blakiston's Son & Co., Philadelphia.

The reviewer takes pleasure in again calling to the attention of our readers what is, in his opinion, the best British text-book on diseases of the eye. This work has now passed to the second edition and has been amplified until it now has 531 pages, with 155 illustrations. Practically everything of importance that should be in a text-book of this size is included. Indeed, the work is so well written and so exhaustive that it might be a little further amplified for publication in a larger book, which I would particularly like to see if the none too good wood cuts and photo tints were replaced by other more artistic and accurate illustrations. The same criticism, however, can not be brought to bear upon the colored illustrations, which are very good, particularly the excellent illustrations of the fundus oculi reproduced from Professor Dimmer's photographs.

An appendix dealing with therapeutics and description of glasses, regulations for vision testing for the government service, together with a very complete index and a pocket card of well-made Snellen test-types is a useful adjunct. The book is recommended for English and American students. H. V. WÜRDEMANN.

**Atlas of Ophthalmoscopy.**—HAAB, O., PROFESSOR, Zürich. Atlas und Grundriss der Ophthalmoscopie und ophthalmoscopischen Diagnostik. With 151 colored and 7 black figures. Fifth, enlarged and improved, edition. München. J. F. Lehmann's Verlag. 1908. 12M. $3.00.

The great popularity of Haab's excellent atlas, chiefly due, as was emphasized in our reviews of former editions, to its practical usefulness, the artistic execution of the pictures, true to nature, and its concise and clear treatise on ophthalmoscopy and ophthalmoscopic diagnostics, is again indicated by the appearance of a new edition. Two new pictures, illustrating retinal hemorrhages, and atrophy of the optic nerve and the retinal vessels, affection of the macula and new formation of connective tissue in the vitreous, from injuries produced at birth by the forceps, have been added; others have been improved, and the text has been revised and augmented.

The publisher, M. Lehmann, deserves special credit for the splendid and handy external appearance of the atlas, and the moderate price. The atlas ought to be in the hands of every one who studies or practices Ophthalmology. C. ZIMMERMANN.

**On the Treatment of Injuries of the Eye.**—LANGE, O., PROFESSOR, Braunschweig. Halle a. S. Carl Marhold. 1908. M. 0.75. $0.18.

Lange gives a very good synopsis of the injuries of the eyeball by penetrating and non-penetrating foreign bodies, sharp and pointed objects, blunt force, thermic and chemical agents, with general principles of treatment. In cauterizations by unslackened lime Lange warns against applications of cold water, as one can never be sure to have all particles of lime removed, and advises to use a concentrated solution of sugar, which converts the soluble remnants into insoluble lime sugar (advice which is open to criticism. as the damage to vision results from deposit of insoluble lime in the cornea. H. V. W.). C. ZIMMERMANN.

**Diagnostics of the Motor Disturbances of the Eyes.**—LANDOLT. E., Paris. "Diaognostik der Bewegungsstoerungen der Augen." 94 pp. with 23 figures in the text and one plate. Leipzig. Wilhelm Engelmann. 1907. Cloth. 3.60M. $0.90.

As pointed out in the preface, the author, in order to determine exactly and properly utilize the clinical symptoms, presented those facts which are absolutely necessary for the recognition of motor disturbances of the eye, especially those with which the practitioner is less familiar. In the first part the anatomy and physiology of the ocular muscles, especially the symmetrical movements and the practical use of prisms, are set forth.

The second part, on the disturbances of motility, discusses paralytic and concomitant strabismus, the differential diagnosis between both, and particularly the diagnosis of ocular palsies. A well arranged table shows for each muscle, if paralyzed, the deviation of the eye, position of false image, limitation of motility and faulty projection, increase of diplopia, position of head (direction of face), secondary deviation of the healthy eye, and the mutual relation of the double images illustrated by red and black lines. Then follow the chapters on strabismus in consequence of disturbances of the centers of the symmetrical and associated movements of the eyes, from lesions of the organs of equilibrium (paradox motor anomalies), and nystagmus.

In the last part, on the seat and causes of the motor disturbances of the eyes, Landolt teaches how to diagnose the seat of the lesion from the symptoms—contrary to the usual fashion of the textbooks to enumerate the various diseases with the concomitant symptoms—first on the isolated palsies of each ocular muscle, then on the different forms of ophthalmoplegia. Finally the causes of palsies and spasms of the ocular muscles are summed up.

The author, who by his orginal investigations and devices has largely contributed to enlightening this difficult field of ophthalmology, has admirably succeeded in giving here a concise and very clear exposition of all that is necessary to know. The splendidly gotten up work is highly recommended as a most useful and reliable guide. C. ZIMMERMANN.

**On Spring Catarrh.**—FELDMANN, F., Giessen. Ophthalmological Essays, Edited by A. Vossius. Halle a. S., Carl Marhold, 1908. 0.86 M. 20 cents.

Feldmann reports on 81 patients affected with spring catarrh, observed in the eye clinic of Professor Vossius, in the University of Giessen. Feldmann's observations coincide in general with those of Saemisch. He then gives the latest results of the pathologic anatomy and discusses the etiology, especially the influences of sunlight according to the observations of Dimmer and Kreibich, with the contrary views of Axenfeld, and the treatment, illustrating the beneficial effect of occlusive bandage by a clinical history.

C. ZIMMERMANN.

**The Otitic Diseases of the Brain, Meninges and Sinus.**—Supplement to the Third Edition. "Nachtraege zur dritten Auflage." KOERNER, OTTO, PROFESSOR, Rostock. Wiesbaden. J. F. Bergmann. 1908. 3 M. $0.75.

Koerner's unusually good book is also of great interest to ophthalmologists, though they do not devote special attention to diseases of the ear. Those familiar with the third edition will be delighted with the appearance of this supplement, which brings the progress in that field of the last five years, and may be procured, to save to the possessors of the third edition the expense of a whole new book, either separately or united with the former edition in one volume. The numbers at the margin refer to the pages to which the new insertions belong and a special index to these has been appended. The chapters on the diagnostic value of lumbar puncture, prognosis and therapy of purulent leptomeningitis and the so-called bulbus operation, are perfectly new, also paragraphs on postoperative meningitis, suppuration between both lamellæ of the dura, statistics of some operators and clinics on the cure of sinusphlebitis and cerebral abscess. The numerous original observations of the author during the last five years are of especial value.

For those who seek information on this important subject the study of Koerner's admirable work is imperative. Its external appearance is excellent. C. ZIMMERMANN.

**Diseases of the Uveal Tract and the Vitreous Body.**—KRÜCKMANN, E., PROFESSOR, Koenigsberg i. Pr., Graefe-Saemisch, Handbuch der gesamten

Augenheilkunde. Second. Entirely New, Edition. Nos. 135 to 137. With 5 figures in the text and 14 colored ones on 8 plates. Leipzig. Wilhelm Engelmann. 1908. 6 M. $1.50.

As the color and surface formation of the iris show considerable deviations, Krückmann considered it indicated, from the clinical standpoint, to at first discuss some variations in the normal structure of the iris, illustrated by very fine colored pictures. Then follows an original essay on inflammations of the iris which clinically appear chiefly on the anterior surface, viz., the rheumatic, gonorrheic and gouty. Rheumatic iritis, complicating, or subsequent to, chronic articular and muscular rheumatism, is characterized by localized and disseminated exudations of fibrin on the anterior stroma and synechiæ of the papillary margin in form of a seam, without opacities of the vitreous.

The iritis of gonorrheic patients has a great resemblance to rheumatic iritis. Its exact bacteriological proof is still missing. This would require punctures of the anterior chamber, a dangerous experiment, on account of the possible infection of the conjunctiva with gonococci.

As the inflammations of the deeper strata of the iris are chiefly due to syphilis, this chapter is preceded by general remarks on ocular syphilis. The author applies his views on syphilis of the skin and mucous membranes to the iris, and describes in detail, early roseola, relapsing roseola of the iris, fibrinous syphilitic iritis, formation of papules, granulation tissue, condylomata, and leukopathy of the iris.

Krückmann's very elaborate treatise is, by its numerous entirely new observations, a most valuable contribution to our knowledge of the structure and diseases of the iris and deserves the highest recommendation. C. Zimmermann.

**Studies on Regeneration of the Nerves.**—Ramón y Cajal, S., Professor, Madrid. Translated by Dr. John Bresler, Lublinitz. 196 pp., with 60 illustrations in the text. Leipzig. Johann Ambrosius Barth. 1908. M. 7.50. $1.85.

In the first section "on the mechanism of regeneration of the nerves" the author gives a critical historical introduction on the investigations of numerous histologists and physiologists, which may be summarized in two principal theories, the monogenistic theory of continuity, and the polygenistic of discontinuity. The propounders of the first maintain that the new formed fibers of the peripheral end of a severed nerve are nothing but the prolongations of the fibers of the central end, produced by budding and growth, while the polygenists think that these fibers originate from the differentiation and gradual conversion of the cells of the sheathes of the old nerve fibers (nucleus and protoplasm of the interanular segment below the sheath of Schwann). These cells soon form a chain whose links later on coalesce and create continuous conductions.

The reason of this discrepancy in solving a problem to which, for fifty years, prominent investigators have devoted themselves, is, according to Ramón, due to misplaced generalization of hypotheses from other branches of science to pathological phenomena and to insufficiency of the technic.

This and the great importance of the problem were the incentive to employ the new silver impregnation for the analysis of the neurofibrillæ of the nerve centers and the disposition of the peripheral ends. Types of Ramón's own experiments, arranged according to the time elapsed after operation, are minutely described. The first group comprises the cases in which the cutting or resection of the nerves were executed with little displacement, the second those in which the reunion of the separated segments was rendered difficult or almost impossible.

We can not enter into the details of these exact experimental and histological researches, illustrated by numerous excellent drawings, and must confine ourselves to a brief summary of the results. They fortify the monogenistic doctrine of Waller, Ranvier, Vaulair, Cornil, Ziegler and Stroebe, etc.

In all experiments with displacement, reaction and suturing the ends of the interrupted nerve into the skin or muscles, a multiform nerve track from the central end crosses through all impediments and in the majority of cases after a sufficient interval of time enters the peripheral segment. The cell bands of Schwann, or protoplasmatic bands, which appear in the peripheral end after the interruption, do not create, by autogenous differentiation, new fibers, but attract and enclose those coming from the scar. Ten points are enumerated for the proof of this process, of which we mention only C.'s observation of numerous fibrillar changes in the whole extent of the scar and the central end. The branches of all these tend to the peripheral end, while the shaft emanates from the central end.

In the simple cases of regeneration of nerves, viz., if the nerve ends remain in proximity, the large majority of the new fibers of the peripheral segment represent the nerve prolongation of the preexisting axon of the central segment. Only in the thin intermediate scar segment are some cleavages. But if the obstacles for neurotization of the distal segment increase and the new fibers risk aberration. the new formation by simple prolongation of the central cylinder axis is supplemented by a multiplication process, commencing in the proximal end. extending over the whole broad scar. and reaching its maximum in the hilus of the peripheral end. It is very likely that the growth. ramification and orientation of the new fibers are governed by the attraction of the chemotactic substances, produced by the cells of Schwann or the protoplasmatic bands of the peripheral end. To this purpose the proliferation of these cells and the generation of orientating sheathes may be especially subservient.

The second part deals with the regenerative and mortal phenomena of the peripheral end, metamorphoses of the neurofibrillæ of the central end. and Tellos' investigations on the regeneration of the motor terminal plates and the small peripheral nerves. traumatic degeneration and regeneration of the nerve fibers in the cerebellum and brain, with conclusions.

Ramón's book is a fundamental work which by the novel and exact methods elucidates the finer anatomic conditions of the regeneration of nerves, in which every physician feels interested.

C. Zimmermann.

**Manual of the Diseases of the Eye.** Beknopt Leerboek der Oogziekten.—Dr. Charles H. May. Translated by Dr. G. J. Schoute. Amsterdam: H. Meulenhoff. 1908.

The very merited success which May's book found among his countrymen induced a number of foreign translations. Six European translations and editions have been made and it has also been translated into Japanese. No wonder that Schoute was attracted to it and by giving his time and energy made a Dutch edition. It will help the student during his study as well as the general physician in later life. The many nice illustrations will decidedly help a good deal. But it cannot—as it does not want to—replace the books written by the Dutch masters themselves. as Straub's. which are known to the reviewer.

Schoute added some things of local interest, e. g.. the spread of trachoma in Holland. and changed others: which made the book not a simple translation, but a Dutch presentation. after the fifth—not the tenth—American edition. He describes. on page 34, how one who can stare can be shown the fundus in the upright image even at the first trial. In chapter III. under "Oblique Illumination." he adds the Berger loupe. a simple instrument, especially valuable when presbyopia is near or present. and which allows stereoscopic vision with magnification. Some additions in the chapter about trachoma are made, e. g., Mulder's operation (excision of a strip of skin with some fibers of the musc. orbicularis)—Schoute took special care to notice the work done by the Dutch ophthalmologists—is mentioned. The reviewer thinks that papillary trachoma is not real trachoma; that this condition of the conjunctival palp. sup. is an exaggerated normal condition, due to chronic irritation, and found very often in spring catarrh. He saw this most typical condition in Lt.-Col. Herbert's clinic in Bombay, who found in these cases the eosinophilia, which is now recognized a symptom of vernal catarrh.

Trachoma is the most widely spread ocular disease over the globe; next to the countries mentioned in the book, it is lamentably frequent in British-India and Japan. Expression of trachoma follicles is often done in Japan with a epilation forceps. May me learn from the Japanese their elegant way for inspection of the retrotarsal fold? The usual way, as described in the book, remains clumsy.

The Dutch description of partial tenotomy (p. 413) is wrong. To enlarge the effect of the tenotomy Koster's method of cutting the Tenon's capsule obliquely backwards, upwards and downwards is mentioned. In the treatment of tuberculous iritis Koster was the first to replace the aqueous humor by sterilized air (p. 169). Instead of salicylate of sodium the reviewer likes aspirin better.

On page 387 the symptoms of differential diagnosis between central and peripheral paralysis of the third nerve are enlarged by the findings of Wertheim Salomonsón, that the musc. levator palpebrae remains excitable to galvanism with peripheral paralysis in antithesis to the central forms.

The American edition without index has 376 pages, the Dutch one 436. The reviewer has only mentioned a few points to show his general appreciation of the book.

The American profession may be proud that May's book has been received so universally. E. E. Blaauw.

**Cataract Extraction.** H. Herbert, F.R.C.S., Late Lieutenant Colonel I. M. S.; Professor of Ophthalmic Medicine and Surgery, Grant Medical College, and in Charge of the Sir Cowasjee Jehangir Ophthalmic Hospital, Bombay. Published by Baillière Tindall & Cox, 8 Henrietta Street, Covent Garden, London. Demy. 8vo. Price, 12s 6d net.

This work is an enlarged and extended edition of the same author's well known smaller manual. Chapter one has been almost wholly adopted from the smaller work, but ten others given are nearly all new material. This increase in matter has necessitated the use of larger pages and we are glad to see larger type and the insertion of nearly a hundred illustrations. It is evident, then, that the work is shaping itself to become a text-book on the subject with which it deals. As it stands at present it does not quite reach the standard one looks for in text-books, because its teachings lean too much towards methods which the author has practised in foreign clinics on natives who, as every one knows, react very differently to the white man. Again, there is a good deal of valuable matter which appeared in the smaller manual which in the larger now is either omitted or put in an altered way which does not appeal to the beginner in the same telling manner which it did in the smaller work. It becomes then more of a work of reference for the expert and a larger companion manual to the smaller work for the beginner. These criticisms apart, however, we have nothing but praise in favor of the work, for the author has undoubtedly spared nothing in his endeavor to give a sound, practical treatise on the subject, and we can recommend it not only to the novice but to those of wider experience. In regard to the illustrations we would suggest that those dealing with the operation should be representative more of the eye and its immediate neighborhood and not so much space given up to illustrating so much of the patient's features, which, when everything is considered, have not much to do with the operative technique. A. A. BRADBURNE.

**Glaucoma Ophthalmomalacia.**—SCHMIDT-RIMPLER, H., PROFESSOR, Halle a. S., Graefe-Saemisch, Handbuch der gesamten Augenheilkunde. Second, Entirely New. Edition. Nos. 138 to 142. 347 pp., with 11 figures in the text and 8 on 2 plates. Leipzig. Wilhelm Engelmann. 1908. Subscription, 10 M., $2.50.

Schmidt-Rimpler's treatise on glaucoma, of 148 pages in the first edition of the great handbook, has, in the second edition, more than doubled its size. Seventy-three pages alone are occupied by the enumeration of literature which is most conscientiously utilized up to December, 1907. The subject is divided into seven sections on symptomatology, differential diagnosis, pathologic anatomy, occurrence and etiology, seat and nature, prognosis and treatment, each of which is presented very exhaustively. We can give here only a few of the author's views:

The often observed receding of the near point in the prodromal stage is attributed to diminished accommodation, as its occurrence in glaucomatous attacks suggests a causal connection, probably due to the increased tension in the vitreous which prevents sufficient relaxation of the zonula.

The greater frequency of hypermetropia apparently pre-exists and forms a predisposition by the greater rigidity of the sclera of hypermetropic eyes. Increase of refraction in some cases is brought about by the displacement of the lens forward, as the narrow anterior chamber shows.

The ciliary neuralgia may be caused by the sudden increase of pressure on the ciliary nerves in their course through the sclera or to a direct affection of the fifth nerve.

Spontaneous pulsation is of great diagnostic value, but is an uncertain symptom, if elicited by pressure on the globe with the finger.

The author recommends as reliable method of exactly ascertaining the sluggish reaction of the pupil, to observe under the loupe the slight spontaneous oscillations of the pupil, which in the affected eye are slower and more limited.

The perception of rainbow colors is a phenomenon of diffraction in the minute opaque particles (epithelium, opaque vesicles) of the edematous cornea.

A steep excavation with visual disturbances generally is glaucomatous, although there is no typical pressure excavation which would prove the glaucomatous process with absolute certainty. The author has seen atrophic excavations of a difference of refraction of 2 diopters. The glaucomatous excavation is due not only to mechanical pressure, but to the influence of the increased tension on the blood circulation, and a simultaneous affection of the optic nerve. The cavernous atrophy of Schnabel undoubtedly contributes in a number of cases to the formation of excavation, but it occurs also in other diseases and is frequently missing in glaucoma.

For the explanation of the amblyopia the scanty blood supply of the retina must not be underrated. The amaurosis in acute inflammatory glaucoma is chiefly due to ischemic paralysis of the retina.

In the production of the grayish green reflection from the pupil the opacities of the refracting media, especially of the lens, are the chief factors, as the author observed in a case of partial dislocation of the lens in which the aphakic portion of the pupil showed the normal blackness.

In hemorrhagic glaucoma other elements, besides the apoplexies of the retina, must be present, as contusions of the eye with hemorrhages into the vitreous are generally not followed by hypertony or ever by glaucoma, and frequently hemorrhages of the retina occur without subsequent glaucoma.

Under differential diagnosis from atrophy of the optic nerve, Schmidt-Rimpler mentions as a valuable symptom the striking mydriatic action of cocain in glaucoma simplex.

In presenting the pathologic anatomy of glaucoma the author lays especial stress on the anatomic findings in the few early cases. which came under anatomical observation, with excavation of the disc, alterations of the filtration angle of the anterior chamber and the blood vessels. He emphasizes that in future anatomic examinations more stress be laid on the quantity of elastic fibers in the sclera of glaucomatous and non-glaucomatous eyes.

Summarizing the larger array of theories on the seat and nature of glaucoma, which are given extensively in historical succession from the earliest times, the author thinks it natural that none of them fully satisfies, as for all cases of this multiform morbid process a single etiological explanation is inconceivable. As in the first edition, he still maintains that various elements must be considered of which the one or other are of especial importance in the individual case.

In the chapter on therapy the technic of the different operations. their indications and disadvantages, the theories of their actions and the medical treatment. are minutely described. Schmidt-Rimpler so far never had occasion to perform resection of the sympathetic nerve. For alleviating the pain cocain with pilocarpin is recommended. In some cases of absolute glaucoma, in which all remedies had failed, instillations of scopolamin were useful.

Under dietetics of the eye the author states his views on the color of protective glasses, deviating from those now more generally prevailing. He says that the smoked colored and yellow, or yellowish gray, lenses are permeable for a greater quantity of light, especially for the more glaring rays (yellow and red) than the blue spectacles. He therefore prefers the blue glasses, as the greater intensity of light is more irritating and detrimental than the irrelevant difference in the influence of the color of the glass on the ultraviolet rays.

In discussing the healing results, the author emphasizes that the longer the observation the smaller is the number of lasting cures. He calls attention to the deterioration of vision ascertained directly after operation in some cases, and says: "A cautious physician will carefully think it over, whether he perform an operation, especially if only one eye with relatively good vision is left." An extract of the very interesting collection of assertions and opinions of a large number of ophthalmologists on the therapeutic methods of glaucoma by iridectomy, sclerotomy and miotics in tabular form by Schoute is given with remarks of Schmidt-Rimpler. They show quite a diversity of views, especially on the treatment of glaucoma simplex.

Four plates give very good anatomic and ophthalmoscopic colored illustrations of excavations, filtration angle, etc.

In an appendix on ophthalmalacia (essential phthisis bulbi), galvanization of the cervical sympathetic, nervina, atropin, cocain, chinin, are recommended for treatment.

The elaborate work is a splendid exposé of our present knowledge on glaucoma, and, most attractively written by an author of such critical knowledge and large experience, of the greatest practical value. C. ZIMMERMANN.

**Transactions of the Thirty-fourth Congress of the Ophthalmological Society, Heidelberg, 1907.**—WAGENMANN, A., Jena, Editor. 393 pp., with 23 plates and 23 figures in the text. Wiesbaden, J. F. Bergmann, 1908. M. 10.60. $2.65.

The rich material contained in this splendidly gotten up volume, allows only of a brief review of some of the papers.

*Elschnig, A., Prag: On physiologic, atrophic and glaucomatous excavations,* found in anatomic examinations of sixty normal eyes, which during life had been examined with the ophthalmoscope, the shape and extent of the physiologic excavation dependent upon the form of the optic canal through the ocular tunics: e. g., if the chorioidal hole is much narrower than the scleral hole the non-medullated tissue of the optic nerve completely fills the chorioidal and retinal portions of the canal and prevents the formation of a larger excavation. If the chorioidal hole is only a little narrower than the scleral, the tissue of the optic nerve does not completely fill the chorioidal retinal portions of the canal, and a physiologic excavation will result. This will be larger, if the mass of the tissue of the optic nerve is less. In consequence of the atrophy of the tissue of the nerve fiber in genuine atrophy, in which the glia and connective tissue of the non-medullated portion of the optic nerve never participate, the surface of the disc slightly recedes, but, as the thickness of the retina surrounding the disc also decreases, an excavation cannot be formed. Therefore in atrophy a pre-existing physiologic excavation can grow only in surface, not in depth. Only if the atrophy of the optic fibers is combined with atrophy of the glia and connective tissue an excavation can develop in an optic nerve, previously not excavated. This coincidence takes place exclusively in glaucoma, as illustrated by the cavernæ found by Schnabel. The only actually existing atrophic excavation is the glaucomatous excavation, produced by glaucomatous atrophy of the optic nerve.

In the discussion Schmidt-Rimpler and Stock asserted their views, which will be better read in the abstracts of their essays in this number of OPHTHALMOLOGY.

*Best, F., Dresden: Connection between near work and myopia,* advanced his accommodative theory of myopia. Through continued and often repeated accommodation in reading and writing, the elastic chorioid is stretched and, like a perforated rubber band, commences to grow unelastic and to tear near the perforation, i. e., chiefly at the posterior pole next to the optic disc.

Sattler, Pfalz, Heine and Elschnig opposed the accommodation theory.

*Roemer, P., Würzburg: Completion of the serum therapy of serpent ulcer.* The principles of the serum therapy are completed and the serum is at our disposal. The task is now to prevent serpent ulcers by timely immunization.

*zur Nedden, M., Bonn: On the occurrence of bactericidal substances in the conjunctival secretion.* The pathologic, not the normal, secretions of the conjunctiva are bactericidal. The chief therapeutic action of astringents is hyperemia and increased transudation of the diseased conjunctiva, with bactericidal or curative inflammatory products.

*Leber, A., Berlin: Clinical and experimental dates to serodiagnostics of eye diseases.* The object of Leber's investigations was to find in the blood-serum and aqueous, substances which are in etiologic relation to the disease. An extract of fetal organs, containing spirochætæ in salt solution was used as antigen. In 100 per cent. of positive syphilitic eye diseases the proof of specific antibodies and thus their presumptive cause was successful. The same result was obtained in the aqueous of a case of tuberculous iritis and three cases of tuberculous parenchymatous keratitis. In a case of gumma of the optic nerve the serum examination fortified the diagnosis. Leber's observations illustrate the great importance of sero-diagnosis in practice. The ophthalmo-reaction with tuberculin creates too intense irritations in diseased eyes to be generally utilized as diagnostic.

*Hertel, E., Jena: On the sensitiveness of the eye to rays of light,* concludes from his researches that the inner parts of the cones play a part in the perception of color. Through the maximal contraction of the inner part the conditions seem to be created for the energy primarily received in the outer parts of the cones to the necessary excitations for eliciting color perceptions.

*Bartels, Martin, Straussburg: On fibrillæ and fibrillar acid of the fibers of the optic nerve,* proved with the method of Bethe, which is described, the primitive fibrillæ of the axis cylinder of the optic nerve. The attitude of the optic nerves towards primary staining, differing from all other nerves, together with the peculiarities of its structure and situation, gives the explanation why in a large number of nervous diseases the optic nerve in particular is affected.

*Birch-Hirschfeld, A., Leipsig: On osteomas of the orbit,* assumes a periostal ossification as the cause of osteoma. In the three cases reported, the Roentgen photography proved very valuable for the diagnosis and plan of operation. The mortality after removal is much less than in cases not operated upon.

*Schieck, F., Göttingen: On albuminuric retinitis,* shows on two cases, due to parenchymatous nephritis, in which the blood vessels of the retina were intact, that the etiological importance of vascular changes can no longer be maintained and more value must be attributed to toxic influences, which may be intensified by diseases of the vessels and subsequent disturbances of circulation. This explains the restitution in a number of cases, and, on the other hand, the large percentage of albuminuric retinitis in arteriosclerotic shrinking of the kidneys.

In the discussion E. Krückmann pointed out, that edema of the retina (accompanying general hydrops or from local vascular affections) suffices and renders the assumption of the influence of toxins unnecessary.

*Krauss, W., Marburg: On the orbital veins of man,* reports on his investigations on the anatomy of the orbital veins by means of injections and radiography. The superior ophthalmic vein is the main for the venous blood, the second largest is the lacrimal vein and the third almost always the inferior ophthalmic vein. The superior ophthalmic vein empties into the cavernous sinus, anteriorly it is divided into two branches, one to the frontal, the other to the angular vein. If one of these branches is small, the other is large and forms a wide communication with the facial vein, which frequently surpasses its posterior connection with the sinus, a fact which so far has not been sufficiently appreciated. Through the considerable arch-like anastomoses between the inferior and the superior veins a communication of the orbital veins with those of the face is established, which can evacuate at least as much blood into these as into the cavernous sinus. Thus the anatomic conditions have been ascertained for the assumption that the outflow of the venous blood of the orbit and of the eyeball may take place in all directions, especially forwards. Krauss' researches confirm and extend the observations of Sesemann.

He also supports the opinion of Birch-Hirschfeld that in stooping the head the blood from the orbit flows into the facial vein.

*Greeff, R., and Clausen, W., Berlin: On double bodies in trachoma cells,* devoted their special attention to the corpuscle cells, (so called by A. Leber), in the follicles of trachoma and found most minute dipplococci, just visible with oil immersion and ocular 8, in numerous cases of trachoma from various regions. No positive cultures could be cultivated. Halberstaedter and Prowazek declared them identical with those found by them in Java in some trachoma patients and in artificially infected Oranatang. Greeff inoculated material, taken from the follicles of trachoma patients, on the conjunctiva of healthy people, with their permission, and produced trachoma after a latent stage of three days.

Axenfeld recommended the utmost reserve in declaring the diplococci found by Greeff as the morbid agents of trachoma.

*Ulbrich, H., Prag: To the doctrine of the current of the intraocular fluids. Partial congenital coloboma of the iris, closed by a movable membrane.* This membrane formed a natural manometer between anterior and posterior chambers. Its inward or outward movements indicated that anterior and posterior chambers are two separate parts of a capsule, filled with liquid. If, through pressure with the finger, the tension in the anterior chamber was raised by the least amount, the membrane at once receded into the posterior chamber, also upon accommodation.

*Axenfeld, Th., Freiburg: Anterior scleronyxis after previous iridectomy,* demonstrated a new method of reclination, practiced with good results on four patients, which allows to see every step of the operation and inflicts very little damage to the vitreous.

*Axenfeld, Th.: Extirpation of the tarsus in blepharitis ectropium and madarosis,* describes his new method devised for this kind of ectropium with which he had good results.

*Uhthoff, W., Breslau: Contribution to the anomalies of growth in temporal hemianopia, respectively affections of the hypophysis,* reports three cases of temporal hemianopia with general adiposity in young people. Uhthoff attributes to adiposity with abnormal physical development in cases of temporal hemianopia in young individuals great value in the diagnosis of tumor of the hypophysis and its surroundings.

*Bernheimer, St., Innsbruck: On the commissure of Gudden.*

*Wehrli, E., Frauenfeld: New clinical and histological investigations on the etiology of nodular keratitis* (Groenouw), reports two cases of most likely tuberculous nature.

*Harms, Cl.: On new formation of connective tissue in the retina,* found anatomically new formed connective tissue in a case of sudden impairment of vision, with following glaucoma, sclerosis of the retinal arteries and veins and thrombosis of the central vein. Harms sees in his case and two of Hirschberg's clinic, published by Dahrenstedt and Fehr, the proof that in all cases the new formation of connective tissue is preceded by disturbances of circulation. The subsequent oozing of contents of the vessels need not be hemorrhagic.

*Freytag, G., Muenchen: The natural principles of numbering the meridians of the eyeball,* count on both sides 180° from the nose upward toward the temple.

*Franke, E., Hamburg: On plastic operations on the lids and orbit.*

*Von Sicherer, Muenchen: Ophthalmoscopic examinations of new-born children,* examined 400 eyes of new-born children, after instillation of 5 per cent. homatropin. with the electric ophthalmoscope. The color of the iris was light gray with a blue or green hue, only one child had a dark iris; 2.5 per cent. had a pupillary membrane. The fundus in general corresponded with that of adults, but usually was somewhat lighter. The retinal reflexes, especially of the macula, in some cases were very marked. The discs were chiefly light, in some children dark gray and bluish gray, which disappeared after a few days and most likely was due to hemorrhages into the optic nerve. No conus were found, but in numerous eyes a marked pigmentation at the temporal margin, sometimes around the whole margin. The refraction in all was hypermetropic, also in two children of highly myopic mothers. This corresponds with the examinations of others and the assertion of Schleich, that the normal eye of the new-born is exclusively hypermetropic. Sometimes a venous congestion, especially in cases examined soon after birth, was noticed.

The most striking changes were hemorrhages, in 42 out of 200 children (in 65 out of 400 eyes), in the retina and optic nerve. In one case the whole eye was filled with blood. Fifty-eight children were examined in the first 6 hours after birth, 46 in from 6 to 12, 43 in from 12 to 18, 53 in from 18 to 24, none later than 24 hours after birth. The hemorrhages occurred in small or larger round patches, most frequently at the posterior pole and extended rather far into the periphery (according to E. von Hippel, in the layers of the nerve fibers and the ganglion cells). They disappeared in the course of six days and left no white foci.

With regard to etiology, the author attributes with Schleich, the hemorrhages to intense congestion during birth. This was strengthened by his observation, that in first skull presentation the right eye was exclusively or more intensely affected, and vice versa in second presentation. A greater compression of the skull, strangulation by the umbilical cord and asphyxiation seem to favor their occurrence. The influence of the hemorrhages on later impairment of functions, amblyopia without objective findings, can only be ascertained by examinations repeated after years. Thus the traumatic nature of congenital amblyopia can be proven beyond doubt.

Only in one case, which exhibited no hemorrhages, the forceps had been applied. Physiologic excavation of the disc was found in a large number of cases.

*Dimmer, F., Graz: A subconjunctival method of cataract extraction,* describes a new method which he thinks avoids the difficulties and disadvantages of Czermak's method.

*Colling, R., Berlin: Experiences with Behring's tulase preparations in the treatment of tuberculous eye affections,* so far, did not admit of a conclusive decision as to the therapeutic value of tulase.

*Fleischer, Tuebingen: On inheritance of myopia,* examined, out of 1,353 inhabitants of a village, the eyes of 200 persons and of 320 school children. The myopia of the school children presented the usual percentage and was of moderate degree. The degree rose at the age of puberty. Fifty per cent. of the children whose one parent had high myopia, had myopia or myopic astigmatism. If both parents were myopic, all the children had abnormal eyes, which shows a marked inheritance of abnormally developing eyes.

The report on the demonstration meetings concludes the interesting book, which we urgently recommend to our readers.

C. ZIMMERMANN.

**Ophthalmic Surgery.**—MELLER, JOSEF, Privatdocent and First Assistant K. K. II University Eye Clinic, Vienna. With 118 original illustrations. Price, $3.00, net. P. Blakiston's Son & Co., Philadelphia, 1908.

Privatdocent Meller, as first assistant to Hofrat Fuchs at the Allegemaines. Krankenhaus, Vienna, has for a number of years been in position to enjoy an experience that comes to but few, and that he has availed himself of this opportunity may easily be appreciated when one reads his Ophthalmic Surgery. Having been one of the many American pupils of Dr. Meller, the reviewer appreciates the conscientious work of the man and admires his unselfish effort in presenting this admirable work to us, and feels that this book stands as a guide and help to both student and practitioner of ophthalmology.

We are greatly indebted to the author for the fine finish of the paper, the good type used in the printing and the excellent illustrations in this new book. It is indeed rare to find such a happy combination. The illustrations by Wenzel are both accurate and excellent.

The chapter on extirpation of the lacrimal sac is easily the best exposition of this operation that we have ever seen. Each step is minutely described and with the many illustrations added it makes each step of the operation clear. A most interesting chapter is the one that deals with the operation of cyclodialysis. This operation is indicated by the author in cases of:

First, primary glaucoma, in which iridectomy is not only difficult, but dangerous.

Second, in cases of glaucoma where the patient has lost the other eye by glaucoma malignum or a severe hemorrhage.

Third, in certain cases of secondary glaucoma.

The author does not consider cyclodialysis as preferable or even equal to iridectomy, but as a valuable aid where iridectomy fails or is indicated.

In many of the operations described in this book the author advises the use of local anesthesia by a modified Schleich's method. The reviewer has observed in Vienna a number of enucleations and also radical mastoid operation performed under local anesthesia; but while this procedure is preferable from the operator's standpoint, it is not tolerated in the majority of cases in this country.

In cases of senile cataract the orthodox operation is performed by the author with the one exception, i. e., he prefers the capsule forceps to the cystotome for the removal of the anterior capsule of the lens and lays particular stress on the necessity of the total removal of the anterior capsule in order to prevent an obstruction to vision.

Entropion, ectropion, trichiasis and ptosis operations are described and illustrated in a comprehensive and instructive manner.

Gustavus I. Hogue.

# INTERNATIONAL CONGRESS OF OPHTHALMOLOGY, NAPLES, APRIL 2 to 7, 1909.

## SECOND CIRCULAR.

*Honorable Colleague:*—In repeating to you the invitation to take part in the International Ophthalmological Congress of Naples, we add—for the ophthalmologists who are occupied in questions concerning blindness and the betterment of the condition of the blind—that from March 30 until April 3 the International Congress of Typhlology will also be held in this city. The members of the Ophthalmological Congress will be invited to take part in the afternoon session, to discuss together the following official subject:

"Whether it be advisable in the treatment of patients afflicted with diseases immediately conducive to blindness, to give them correct information as to the precarious condition of their sight and such instruction as may be necessary to them when blindness overtakes them."

The sittings of the Ophthalmological Congress will take place in the buildings of the Royal University of Naples, by kind permission of the rector.

The exhibition, in connection with the congress, of subjects appertaining to ophthalmology, touching its practical as well as historical side, will be situated on the premises of the R. Clinica Oculistica in S. Andrea delle Dame.

In order to honor the memory of the founder of the Eye Hospital of Naples, on the occasion of the congress, the presidency, from the remaining funds of the International Subscription of 1905 intended to commemorate the lamented master, will assign six gold medals, each bearing the inscripton of "Premio de Vincentiis," with the purpose of encouraging young students of ophthalmology, to the authors of the six most valuable as yet unpublished articles on the subject of ophthalmology. The latest date for the presentation of the articles, which should be typewritten, has been postponed until October 31. The authors are further recommended to send the registration fee not later than January next, accompanied by a visiting card with the exact address, for the careful addressing of the membership tickets and of the request for the reduction in the rates for the sea and rail traveling in Italy.

Members wishing to secure rooms in advance should apply to the presidency of the committee, not later than February, 1909, that they may obtain, during the time of the congress, apartments in the best hotels overlooking the sea in Naples and Posillipo.

Under the management of the committee, an excursion will be arranged to Capri by steamer, visits to the Grotta Azzurra and Sorrento; to Pompeii and its excavations; and to Pozzuoli, with visits to the antiquities and the Solfatara.

In conclusion, the members of the congress will receive all necessary information concerning visits and excursions to the city and suburbs, museums, Vesuvius, etc., for which the government and municipality will show the utmost liberality, and private societies will offer greatest facilities.

Kindly accept, eminent colleague, the assurance of our most distinguished consideration.

For the managing committee.

THE PRESIDENT, PROF. A. ANGELUCCI.

*Corresponding Members of Great Britain.*—Dr. Walter Jessop, London W., 73 Harley Street; Dr. George Mackay, Edinburgh, 20 Drumshead Gardens; Sir Henry R. Swanzy, Dublin, 23 Merrion Square.

*For the United States of America.*—Dr. Hermann Knapp, New York, 26 West Fortieth Street; Dr. G. E. de Schweinitz, Philadelphia, 175 Walnut Street.

OPHTHALMOLOGY
ESSAYS, ABSTRACTS AND REVIEWS.

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## *Original Articles.*

# DECOMPRESSION IN CHOKED DISC.*

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PHILADELPHIA.

Choked disc may be defined as that particular form of optic neuritis due to tumors, etc., of the brain. It may not, however, be associated with symptoms localizing the growth. In all cases, regardless of the cause, whether tumor, meningitis, syphilis, orbital or general disorders, it is always attended by a rise of intracranial tension or pressure. Increased pressure within the calvarium can only be relieved by displacement of the cerebrospinal fluid in the direction of the cord or of other lymph outlets, such as the optic nerve. A glance at the anatomy of the nerve shows plainly why strangulation of the papilla takes place, and why choked disc should be classed as an inflammatory edema rather than a true neuritis. The three sheaths of the optic nerve correspond with and are continuations of the coverings of the brain. The pial sheath closely hugs the nerve, while the dura, much thicker and firmer, is separated from it by the intervaginal space folded loosely, in which is the arachnoid membrane. The intervaginal space ends by a cul-de-sac within the sclera, and becomes prominent when pathologically dilated by an increase of cerebrospinal fluid. The optic nerve is thinnest at its entrance into the sclera, and is here enclosed in firm fibrous canals; hence when swelling of the nerve takes place, constriction with strangulation may readily occur.

Upon this arrangement of the parts is based Schmidt's and Manz's theory of the origin of optic neuritis. In consequence of accumulation of fluid in the intervaginal space, a lymph stasis occurs in the trunk of the optic nerve, especially at the lamina cribrosa. Edema at this point produces compression of the central vessels, felt sooner and to a higher degree in the vein. As the artery is introducing a supply of blood in excess of the amount which can be carried away by the contracted vein, engorgement and swelling, resulting in strangulation of the papilla, ensue.

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* Read at the November, 1908, meeting of the Wills' Hospital Ophthalmic Society.

Tumors of the cerebellum are most often associated with choked disc. The posterior fossa is hemmed in by the tentorium, which stretches over it and is but slightly yielding. Compression of the aqueduct (of Sylvius) or of the vena magna Galeni is thus readily produced, with consequently a stasis of the cerebrospinal fluid in the anterior ventricle.

On the other hand, basal tumors rarely produce choked disc, because they may block the orifice by which the intervaginal space of the optic nerve opens into the cranial cavity, so that the cerebrospinal fluid does not enter the space.

*Symptoms.*—Beyond the failure in the visual acuity which varies from slight diminution to absolute loss of sight and the dilated pupils, there is no gross external symptom indicating this grave disorder. Choked disc sometimes manifests itself without any diminution of vision (probably in the beginning only an edema without inflammation or atrophy). There may be frequently repeated attacks of momentary obscuration of vision. The fields of vision are usually contracted, especially those for color. Hemianopsia may be present and more or less extensive paralysis of the extraocular muscles may be noted.

With the ophthalmoscope, however, a picture is presented, at once striking and characteristic. The papilla is of a color ranging through all gradations from red to white. It may be mottled with white spots and hemorrhagic areas. It may be so uniformly swollen and translucent as to justify Gunn's descriptive term of "juicy," or the changes spoken of as "striations," "stippling," "dotting," "shrinkage" and "atrophy," may be present. Swelling is pronounced and the papilla appears of greater diameter than normal. The margins of the disc are obscured or are entirely obliterated by the extension of the exudate into the adjoining retina. The arteries are thinner: the veins thick, black and tortuous. The vessels may appear broken, owing to their dipping down into the clouded tissues.

The treatment of those cases of optic neuritis known as "choked disc" is undoubtedly operative. Sir Victor Horsley, in his paper upon this topic in the September number of *The Ophthalmoscope*, vol. vi, summarizes his remarks as follows: (1) All cases of optic neuritis should be relieved as soon as possible by operative treatment. (2) Operation, in the absence of other indication, should be opening of the subdural space in the temporal or subtentorial region. (3) The surgeon should be held responsible for subsequent blindness if the neuritis is not treated as soon as detected.

Before relating in detail the record of a case which presented itself to Dr. McCluney Radcliffe's clinic at Wills' Eye Hospital in this city, during his vacation, I wish to thus publicly thank Dr. L. C. Peter and the staff of the Northwestern General Hospital for their courtesy to me.

W. C., aged 40, laborer, presented himself Sept. 2, 1908, complaining of failing vision and headache. Family history was negative. Had typhoid fever when a boy. Denied specific disease. Two years previously, as the result of frequent attacks of neuralgia, he had had an operation, probably a neurotomy, performed upon the right supraorbital nerve, at the Jefferson Hospital. Otherwise had always enjoyed good health until two and one-half months before I saw him, when he developed an attack of inflammation of the stomach. Two weeks later he noticed double vision with some vertigo, but no central vomiting. He experienced difficulty in walking, and staggered and swayed from side to side, attributing this to his poor sight. Life became unbearable because of a violent pain in the head, beginning at the forehead and extending back to the occiput. It was not constant, at times worse than at others, and occurring at irregular intervals throughout the entire day. Sleep was much disturbed, and was often broken by the occurrence of the pain in the head. He had had constant medical attendance, and was finally referred by his physician to this hospital for the relief of his ocular symptoms.

Upon examination, vision with the right eye equalled 20/c, while that with the left was 20/l. The lids were normal, the eyeballs prominent and the cornea clear. The pupils equalled 3.2 mm., and the irides reacted promptly to light and accommodation. The left eye rotated upward and inward. There was a paralytic convergence and an homonymous diplopia to the right and left and below. The excursion outward was diminished in both eyes, being limited to the median line in the left. Double images revealed an homonymous diplopia, due to paralysis of both external recti and of the left superior oblique. The visual fields were slightly contracted.

With the ophthalmoscope, under homatropin dilatation, the pupils dilated evenly and widely. In the right eye there was a marked swelling of the optic disc, the apex being best seen with a + S. 7.00 D. lens. There was extensive edema of retina, producing the characteristic "wooly appearance" of the nerve. The margins of the disc were obliterated, and the nerve head was profusely covered with variously-sized, flame-shaped hemorrhages. The arteries were small and threadlike; the veins were large, black and tortuous; the vessels appeared broken. There was the same general appearance, but to much less degree, in the left eye.

From the appearance of the disc (choked), the absence of any general exciting cause, a diagnosis of tumor of the brain was suspected. The ataxic symptoms indicated the cerebellum. In the absence of localizing symptoms, but with undoubted pressure palsies and strangulation, the diagnosis of increased intracranial pressure was apparent. The fact of the right disc being the more actively and from all appearances the first involved would locate the tumor upon the right side of the brain.

In consultation with Dr. Paul J. Pontius and Dr. Peter, a diagnosis of optic neuritis, due to increase of intracranial pressure, from a probable right-sided growth of the cerebellum, was made. The following is the report of Dr. Alfred Gordon, the neurologist to the Northwestern General Hospital: "Gait somewhat unsteady, tendency to walk to the right, power in both upper and lower extremities normal and equal. Right knee-jerk diminished; somewhat increased on the left. Tendo-Achilles reflex normal on the left; very faint on right. Sensation normal and equal on both sides. No sphincter involvement. Babinski signs absent on both sides, but paradoxical reflex present on the right and doubtful on the left. Both external recti muscles involved. No complete excursion of the eye globes externally. Slight exophthalmos on the right, also some nystagmiform movements when the eyes are turned to the right. Pupils equal and react to light. *Diagnosis.*—In view of the continuous headache (with exacerbations), nystagmiform movements on the right and the condition of the reflexes on the right, the presumption is in favor of intracranial pressure, probably in the region of the cerebellum, more on the right than on the left. Advise operation at the earliest convenience to save patient's sight.

*Treatment.*—The operation of decompression was advised and the patient was referred to the Northwestern General Hospital, where on Sept. 14, 1908, the subdural space was opened in the occipital region, by Dr. J. Thompson Schell, on each side by means of a trephine. These openings were connected by removal of the intervening bridge of bone with the Rongeur forceps. Upon removing the button of bone on the right side, the dura bulged outward, and the incision was followed by the escape of a considerable quantity of cerebrospinal fluid. No growth was demonstrable. Upon opening the left side, the dura did not show evidences of internal pressure; there was no escape of fluid nor the presence of a growth.

In three days' time the patient reacted well. He had had only one or two attacks of headache since, and these very mild. He fixed with either eye, the excursion outwardly being much improved; diplopia being present only upon strong abduction. With the ophthalmoscope the swelling of the optic discs had greatly reduced (+ S. 3 D. to + S. 4 D.), their borders being still obscured and the retinal edema subsiding. On September 9 the patient left his bed and felt comfortable. There was some improvement in gait, although the patient was weak. The ocular excursions were still improving. There was no diplopia upon strong effort in any direction. With the ophthalmoscope, the apex of the disc could be best seen with + S. 2 D., the vessels being better defined and of relatively normal size. The retinal edema was very much reduced. There were but a few small hemorrhages on the disc. There was a small vitreous opacity in the right eye. The margins of the discs were hazy.

Three days later the patient was discharged from the hospital. Examination by Dr. Peter at this time showed perfect ocular excursion in all directions, there being binocular single vision. Esophoria equalled six degrees; vision equalled 15/xl. On October 2 vision equalled 20/lxx and 20/xl partly. The esophoria had become reduced to three degrees. On Oct. 12, 1908, vision equalled 20/xl and 20/xxx partly. The apex of the disc was but + S. 1 D. to + S. 2 D. A saturated solution of iodid of potassium in increasing doses three times daily was ordered.

The course of this case seems to the author to confirm the opinion of Horsley, that simple opening of the calvarium is not sufficient, but should be associated with free incision into the dura. There are two places where the cerebrospinal fluid is held by the arachnoid, in the form of a cisterna, which can readily be approached: (1) the interpeduncular cisterna by way of the squamous portion of the temporal bone, and (2) by the subtentorial route through the occipital bone, attacking the cisterna beneath the cerebellum.

"Few things," says Horsley, "are more striking after operation for intracranial tumor than to see the rapidity with which the swelling and degenerative changes of the disc and retina clear up. Certainly it seems to occur with the same rapidity whether the operation is performed above or below the tentorium."

The location of the tumor may be determined by the age of the neuritis being upon the side where the changes have advanced the more, regardless of the amount of swelling. The degree of atrophy may be considered a guide to the prognosis of the amount of relief afforded by an operation. Neurologists generally are agreed that decompression is usually associated with subsidence of choked disc, regardless of the continued presence and growth of the tumor.

In conclusion, permit the author to say, with Horsley, that the question of the saving of sight, even in people who are the subjects of a fatal disease, is so important as to include all classes of cases: (1) those in whom it is possible to remove tumors and get them well; (2) those who have meningitis and recover, and (3) those who have malignant disease and ultimately succumb.

# OCULAR AND ORBITAL SYMPTOMS OF THROMBOSIS OF THE CAVERNOUS SINUS.*

Edward Jackson, M.D.
DENVER.

This paper is based upon 2 cases of my own, the paper of Dwight and Germain, who reported 4 cases and studied the records of 178 previously reported, and upon 25 cases published since the appearance of that paper, by Chance (2), Day (1), Finlay (1), Lodge (1), Ellett (3), Risley (2), Prefontaine (1), Miles (1), Werner (1), Stocker (1), Langworthy (4), Seggel (1), Henderson (1), Snell (1), Fridenberg (2), Zentmayer and Weisenburg (1), and the case reported to-day by Neuman.

Thrombosis of the cavernous sinus arises without sepsis from entirely general conditions of the blood, or of the blood pressure. Septic thrombosis occurs by extension from the other cerebral sinuses, from diseases of the middle ear or mastoid, from the nasal accessory sinuses, the tonsils or jaws, as a sequel to furuncles of the lips, cheek, nose or other parts of the face, or by lesions of the lids, or contents of the orbit.

Of the 182 cases which form the basis of the paper by Dwight and Germain, the source of infection was given as the eye in 4, nose in 9, mouth in 14, face in 34, and lips in 2; and of the 149 cases which come to autopsy, 43 had originated in the ear. Thomson thinks the most common cause is disease of the sphenoidal sinus. Of the 28 cases which I have collected, I find that, while 1 was caused by ocular inflammation and 1 by injury to the orbit, 4 seemed to arise directly from general conditions (scarlet fever, 3, and marantic thrombosis, 1); abscess of forehead, cheek and lips, 3; lacrimal abscess, 1; disease about the teeth and tonsils, 1 each, and disease of the middle ear and mastoid, 13.

The cavernous sinus lies quite within the cranium, and not in the orbit, where the ophthalmic surgeon is supposed to find his domain. But it is the ocular and orbital symptoms that are characteristic of it, and upon which the diagnosis must rest. As St. Clair Thompson put it at the recent meeting of the British Medical Association, although the ear and nose are so intimately related with the onset of the condition, "the symptoms are more prominent and distinctive in the eye."

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* Read before the Section on Ophthalmology, Otology and Laryngology of the Colorado State Medical Society.

The mass of cases to be found in medical literature (two-thirds of the 27 I have collected) have been placed on record by ophthalmologists, the majority of them in ophthalmic publications. The reason for this is apparent when we see the intimate relations of the cavernous sinus to the nerve trunks and vessels that supply the eyeball and the other structures of the orbit. This lens lies on the outer side of the carotid artery, as that vessel passes along the body of the sphenoid bone. Anteriorly it receives the ophthalmic vein, the outlet for the veins that unite about the apex of the orbit. Passing through its wall, and separated from its contents only by the lining membrane, are the sympathetic fibers of the carotid plexus, the ophthalmic branch of the fifth nerve, the trunks of the oculomotor and patheticus, and, a little to the outer side, the abducens or sixth nerve. The most important symptoms of cavernous sinus thrombosis are those of interference with the functions of these intimately related structures. They include the effects of venous obstruction at the apex of the orbit, paralysis more or less complete of the various ocular and orbital muscles, and pain throughout the distribution of the ophthalmic branch of the trigeminus nerve.

Pain may be the first condition to call attention to the involvement of the eye. Occasionally the patient supposes that a foreign body has lodged in the conjunctiva. More frequently it is a deep-seated, severe headache, but often it is not so severe as would be expected from the appearance of the parts. Sometimes little complaint is made of pain, and only a sense of discomfort is admitted upon inquiry. Commonly the complaints of pain do not increase with the increase of other symptoms, although in most cases the patient remains conscious and rational till very near the fatal termination.

Paralyses of the ocular muscles and of the elevator of the lid may appear early, or they may not be noticed throughout the course of the disease. Diplopia occurs perhaps as much from displacement of the eyeball as from paralysis of the ocular muscles. It is difficult to discriminate between slight impairment in the action of the muscles involved and the fixation of the eyeball due to general swelling within the orbit. The motor palsies are more apt to be pronounced, and to have practical significance, in the chronic cases, particularly those that go on to diminished swelling in the orbit. In more acute cases, with rapid, severe swelling in the orbital tissues. the motor condition is masked, the eyeball often becoming fixed by orbital pressure before any distinct failure of any muscle or group of muscles can be made out. In general, all the parts supplied by a particular nerve suffer together; thus failure of accommodation and partial dilatation of the pupil are seen, with the weakness of all the extraocular muscles supplied by the oculomotor nerve.

The consequences of venous stasis, exophthalmos, swelling of the tissues of the orbit and lids, and chemosis, are the most constant and significant of the ocular and orbital symptoms of thrombosis of the cavernous sinus. Prominence of the eyeball and swelling about the orbit may be the first symptoms pointing toward involvement of the sinus. When attention is attracted to the eyes by pain, or in any other way, swelling and exophthalmos will almost invariably be present, constituting the first definite evidence of involvement of the cavernous sinus.

The swelling begins at the back of the orbit, pushing the eyeball forward; hence exophthalmos is present from the first, and continues to increase for a period of two to ten days. Swelling of the lids and conjunctiva usually appear a little later, but they may be quite marked when the patient is first seen, within a few hours after the occurrence of the thrombosis. The extent of the swelling may vary greatly. In a few chronic cases it has been notably intermittent, but it is always very marked within the orbit, and it may involve the brow, the cheek and the whole side of the face. If the case runs a somewhat chronic course, the swelling is apt to diminish subsequently, even in fatal cases, as in that of Henderson, which ended fatally on the eighteenth day. This diminution of swelling may follow incisions into the lids or orbit, or it may occur spontaneously, brought about by development of collateral circulation when the thrombosis ceases to extend. Several cases, like that reported by Dr. Neuman, show that the swelling can be entirely removed by the development of collateral circulation, without any re-establishment of the venous outlet through the sinus.

The ophthalmoscopic evidences of stasis are present in a large majority of cases. These are generally described as optic neuritis, or retinal edema and venous obstruction. Sometimes they go on to well-marked choking of the disc, but in many cases only moderate blurring of the margins of the disc, with some enlargement and tortuousity of the retinal veins, appears before the fatal termination. Probably this much change in the eyeground could be found in nearly all cases. It may be noted that incipient or developed optic neuritis is present in a larger proportion of cases of cavernous sinus thrombosis than of thrombosis affecting the other cerebral sinuses. Thus, Langworthy noted optic neuritis in three out of four cases of thrombosis involving the cavernous sinus, while among 22 cases affecting the other cerebral sinuses, but without cavernous sinus thrombosis, there were only five cases of optic neuritis. This special liability to fundus changes may be of diagnostic value when the swelling is confined to one side, or the thrombotic process has also affected the other cerebral sinuses.

The impairment of vision varies greatly in different cases. In some it is noticed shortly after the pain and exophthalmos; in others it is not noticed at any stage of the case. It may be due to the interference with the retinal circulation, or to pressure and disturbance of circulation farther back. In Seggel's case there was but little abnormal in the ophthalmoscopic findings, but the patient recovered with great limitation of the field, pointing toward disease of the chiasm or optic tract.

In the chronic non-fatal case reported by Zentmayer and Weisenburg, vision was materially reduced, and there was some atrophy of the optic nerve, probably postneuritic. In Stocker's case, where the patient survived four years, central vision was lost. At an early stage there was severe edema of retina and disc, and later some optic atrophy and broad white stripes, with indistinct margins in the retina. Day's patient recovered with the eye damaged by corneal ulceration. Werner's case recovered, and "when last seen the eye was perfect." These four are the only patients that survived the attack among the 28 cases I have collected. Among the 182 of Dwight and Germain were 14 recoveries, but no statement is made regarding subsequent vision.

Even when the case runs a comparatively rapid course the cornea is often seriously damaged by exposure, and in some cases has sloughed before the fatal termination, but the corneal ulceration and opacity show no characteristic differences from those seen in exophthalmos from other causes.

In the great majority of cases both eyes are affected, the thrombosis extending from one cavernous sinus to the other through the circular sinuses. Of the cases collected by Dwight and Germain, 134 autopsies showed only 31 in which the thrombosis was limited to one cavernous sinus. In 65 both sides were affected, and in 28 other sinuses were also involved. The tendency to involve both orbits is an important diagnostic point. making clear the distinction between orbital cellulitis, or thrombosis of the orbital veins, and involvement of the cavernous sinus. Local swelling in one orbit extending to the lids and neighboring parts of the face may pass the median line, but in such a case there is not likely to be any exophthalmos. Exophthalmos of the second eye, appearing with the usual symptoms of this disease, makes the diagnosis of thrombosis of the cavernous sinus practically certain. In cases that remain unilateral throughout, the diagnosis may be questioned until confirmed by autopsy, although in the series of cases above referred to I have included some in which but one orbit was affected.

In considering the bilateral character of the disease, a symptom that may be of much importance is one I observed in a case seen at the Denver County Hospital. The patient, suffering from heart disease, with greatly reduced blood pressure, showed a slight swelling of the right cheek, which disappeared in a few hours, as exophthalmos and other evidences of venous stasis appeared on the left side. It seemed to me that this was best explained by a beginning thrombosis in a vein on the right side of the face, with displacement of the clot into, and increase within the left cavernous sinus. The subsequent course of the case confirmed this view. In a number of cases the eye noted as first involved has been on the opposite side from the original seat of disease, admitting of the same explanation. Thomson gives a picture of greater involvement of the right eye, although the infection came from the left ear. This evidence of bilateral involvement, in the crossing over of the infection, may be considered as pointing strongly to a lesion of the cavernous sinus, even though the exophthalmos, swelling of the lids, and ocular palsies remain confined to one side.

## SUMMARY.

Thrombosis of the cavernous sinus, though not usually caused by ocular disease, is always revealed by the ocular and orbital symptoms. These, in the order of their importance, are: Exophthalmos, appearing suddenly, and progressively increasing through some days, its significance being greatly increased when the affection is in any way bilateral. With the exophthalmos come swelling in the orbit and lids, which may extend to the whole face. Evidences of venous stasis within the eyeball, and large tortuous veins, hazy retina, obscured and swollen optic disc, "optic neuritis." Palsies of both the external and internal muscles of the eyeball, chemosis and inflammation of the conjunctiva, and corneal involvement by exposure.

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# A QUERY INTO THE EFFECT OF INTENSE SUNLIGHT ON THE EYE OF THE BLONDE TYPE.[*]

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(Preliminary Paper.)

Before taking up in detail the possible harmful effects of light on the eye in those sections of our country where sunshine is almost continuous, and, owing to altitude and sparseness of vegetation, of an intensity which is not common to lower elevations, and those in the vicinity of great bodies of water, we will review briefly the arrangement of that structure present in the organ whose function it is to protect it from such effects. We know that it is the pigment cell as found in the chorioid, retina and iris. In addition it is possible that the fluid and semi-fluid media of the eye may possess some absorptive power for the so-called chemical rays.

### ARRANGEMENT OF PIGMENT IN THE HUMAN EYE.

*Chorioid.*—The chorioid coat is commonly called the dark coat of the eye, because of the presence of this pigment. It is described as a dark, reddish-brown, highly vascular tunic or membrane, lining the sclerotic from the optic nerve to the ciliary ligament. Its outer surface is in contact with the inner coat of the sclerotic, to which it is attached by the membrana fusca, and on its inner surface the retina is supported. The chorioid proper consists of an external and internal layer. Situated in the external layer or stroma layer, we have large star-shaped pigment cells, which are connected by a delicate stroma. They are enclosed between the meshes of a capillary network derived from the larger branches of the short ciliary arteries.

*Pigment Layer of the Retina.*—Between the chorioid and retina lies a delicate membrane, the pigment membrane. It consists of a single layer of hexagonal cells, which rest on the thin transparent membrane—the lamina vitrea—and which are joined with each other by a transparent cement-like substance in such a manner as to leave a clear space between the cells. The pigment granules within the cell are very fine and may be looked upon as held in

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solution in a colorless vitreous substance, which during life is exceedingly soft. The pigment is so arranged that it occupies the peripheral portion of the cell, leaving the central portion comparatively free. Moreover, it is only the inner part of the cell or that nearest the retina which is pigmented. Here, as in the stroma, the quantity of pigment in the cell may vary in different eyes or in different cells of the same eye; it is also of lighter color in pronounced blondes and darker in the negro. In connection with the retina we have another structure, which may possibly play a rôle in protecting its delicate nerve tissue from intense light, namely, the Rhodopsin or visual purple. Physiologists describe the human visual purple as a mixture of red and violet. It undergoes changes under the influence of light, but returns to the normal in a few minutes and may be wholly destroyed by too much light. Howell,[1] in describing it, says: "It will be remembered that the external segments of the rods impinge upon the heavily pigmented epithelial cells that lie between the rods and the chorioid coat. From experiments upon frogs' eyes it appears that a portion of the retina detached from the pigment cells and bleached by the action of light is not able to regenerate its visual purple until again laid back upon the chorioid coat. This regenerating influence of the black pigmented cells may be connected with another interesting relation that they exhibit. Under normal conditions, delicate processes extend from these cells and penetrate between the rods and cones. When the eye is exposed to light, the black pigment migrates along these processes as far even as the external limiting membrane, and it is possible that this arrangement may be useful in obviating diffuse radiation of light from one rod to the other. When the eye is kept in the dark, however, the pigment moves outwardly and collects around the external segments, where the process of regeneration of the visual purple is taking place."

*Iris.*—One of the principal elements composing the iris is pigment. The pigment consisting of polyhedral or round pigment cells is distributed for the most part on the posterior surface. In addition we have the so-called lump cells (Klumpenzellen) first described by Koganëi in 1885. Elschnig,[2] in speaking of them, says: "These intensely dark pigmented cells were formerly considered as lumps of pigment. They occur in three different localizations in the tissue of the iris, viz.: regularly before and behind the sphincter and at the root of the iris of any color, more rarely in the intermediate parts and then in dark irides or in the pigment spots of the blue and brownish irides. They originate in the epithelial layer and are found at the time of the development of the iris muscles."

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[1] Howell: Text-Book of Physiology, 1907, p. 319.

[2] Akademisher Anzeiger, No. 12.

Exner[3] of Vienna reports that the human iris changes markedly in color when the person goes from the dark to the light, yellow-green eyes becoming gray-blue; dilatation of the pupil also causes the iris to become thicker and darker. The changes in color appear to be a phenomenon similar to the changes in the chameleon, but, unlike the changes in that animal, it is not for resemblance to the background but to grade the protection according to the degree of light.

The amount of pigment present in the eye depends as a rule on the general coloring or complexion of the individual. Therefore we commonly divide the human fundi into three classes based on the difference in appearances as noted in the brunette, blonde and albino. Thus when the complexion is dark and the pigmentation of the hair and iris marked, the fundus of the eye will, as a usual thing, present a deeper shade of red and the general details will be more obscured than when the hair and iris are of a light color. Indeed, when the fundus is exceedingly rich in pigment the ordinary yellowish or ochre-red reflection is not present and the tint approaches a grayish-red, in which at times the gray predominates. In those cases, moreover, in which the pigment is really what may be called excessive in quantity, as in some pronounced negroes, the whole fundus seems to have a slaty grayish hue, or even a silvery, sheen-like appearance, with but little or no red tinge in it. When the pigment of the stroma of the chorioid is very abundant with a less amount in the retina and is collected into masses between the interstices of the vessels, it then follows their radiations and gives a peculiar striped appearance, which resembles the markings of a tiger skin (chorioid tigre).

The fundus in a person of light complexion will vary in shade and tone from the lightest and most delicate pink, as seen in some pronounced blondes, to a shade passing through a yellowish orange-red to a pure red. Where the smaller vessels and capillaries are poorly developed, and at the same time the pigment is also deficient in quantity, there the fundus will be less uniform in character, less compact in substance, and the larger vessels especially toward the equator of the eye will be seen in greater detail. Under these conditions in the posterior pole of the eye, in the neighborhood of the nerve, and especially at the region of the macula lutea, where the finer vessels are thickest and the most intricate and the pigment in the epithelial layer the most abundant, there will be, as a rule, a uniform surface with no definite details apparent, except here and there one or two of the larger and deeper-lying vessels of the stroma may struggle into view in subdued contrast with the general uniformity of the rest of this portion of the fundus. Toward the equator of the eye this uniformity in color and texture gives place to a more detailed pattern formed by the interlacing and anastomosing of the vessels, which form a network the meshes of which are more or less circular, ovoid or rhomboidal in shape. Near the equator these meshes become more open in shape and more elongated in form. The branches of the vessels anastomose and interlace less frequently and run more parallel to each other and assume a meridional course. Here the tapering commencements of the venæ vorticosæ can be seen, gradually increasing in size and radiating toward a common center, while at the extreme limit of the ophthalmoscopic field the branches of the outgoing veins come into view.

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[3] Medical Record, Oct. 22, 1904.

Under such circumstances the intervascular spaces are clearly defined and appear in the most posterior parts of the fundus of a delicate pinkish-white, or even especially toward the periphery of a pure white, from reflection from the surface of the sclera, or, to put it in other words, the vessels appear sharply defined against a whitish background.

In the albino the general fundus, instead of being a uniform red, is of a yellowish-white color and reflects a large amount of light. The granular or shagrun effect is entirely wanting and it is only in the region of the macula lutea that there is any trace of any uniformity in color due to an increased degree of pigment in the epithelial layer and to a closer arrangement of the blood vessels. The external vascular layer of the chorioid is sharply designed over the entire fundus, except in the neighborhood of the yellow spot, where it is somewhat veiled by the overlying layers and by an increased development of pigment in the epithelial layer. In certain places the chorioidal vessels of the middle layer show themselves as band-like formations of more or less orange color. These bifurcate and anastomose with each other in such a way that a somewhat irregular network is formed, which usually is of a yellowish-white color and at times of considerable brilliancy of color—so much so, indeed, that one is convinced that this brilliancy is due to a reflection from the sclera (Jaeger[4]).

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[4] Jaeger Hand Atlas, Taf. 18, Fig. 28.

From observation there does not seem to be very much difference between a very blonde person and an albino, yet the former has a sufficient pigment for protection in an environment to which the albino is wholly unsuited. Total absence of pigment is an evidence of degeneration, so that albinos have other defects which more or less account for their shortness of life. Nevertheless, the damage due to the light must be largely responsible. The nystagmus from which they suffer, and virtual blindness in a bright light, are both due to excessive stimulation or even anesthesia of the retina. Woodruff[5] tells us that in the tropics they are said to be blind from 9 a. m. until 4 p. m.

It is to be noted that in all eyes, besides there being a finer and closer network of vessels at that part of the chorioid which corresponds to the macula lutea, there is also an increased amount of pigment both in the epithelial layer and in the stroma of the chorioid, which as a rule gives a deeper and richer tone to this region than to the rest of the fundus.

It must be remembered that all fundi can not be classed as above: there are, of course, exceptions. Loring[6] says that he has seen many blondes, even those approaching an albinotic type, in whom the same uniformity in coloration, the same stippled appearance and the same want of detail as to the visibility of the larger vessels existed as in persons with the average amount of coloring material, or even in those who were deeply pigmented. Then, too, beside the amount of pigment in the pigment layer and in the stroma of the chorioid, the comparative number of small vessels and capillaries take their share in producing a difference in shade since the vascularity, that is to say, the number of smaller vessels and capillaries varies in different individuals, even in persons of the same coloration and general complexion, and finally that the general color and tone of the fundus changes somewhat with the quality of the light employed in the illumination. The whiter the light the less vivid the red, until with ordinary daylight it becomes a delicate rose-pink. Moreover, the stronger the illumination the more pronounced the red hue, and the inexperienced observer will often be surprised to find that a fundus which, seen under the strong illumination and small enlargement of the inverted image appears to be of a vivid red, is, under the reduced illumination and increased enlargement of the upright, a pale yellowish ochre.

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[5] Woodruff: Effect of Tropical Light on White Men.

[6] Loring: Text-Book of Ophthalmoscopy. Vol. 1. p. 46.

### EFFECT OF LIGHT ON LIVING PROTOPLASM.

Von Schmaedel was the first to describe the real reason for the evolution of man's pigmentation. In a paper read before the Munich Anthropological Society in 1895 he showed that it exists by reason of its beneficial effect in excluding the dangerous actinic rays of light—those of short wave lengths, the violet, indigo and blue and the ultra-violet rays. The less actinic rays at the other end of the spectrum—green, yellow, orange red and infra-red—are more or less harmless and penetrate more or less deeply through the skin. In dark skins the ultra-violet are almost wholly absorbed. Dr. R. W. Felkin was the first to call attention to this fact in English journals.[7] And it should be remembered that the pigment cells just beneath the so-called outer skin and in the iris retina and chorioid coats of the eye is present in all normal men, the difference in color being merely differences in the amount of pigment. So that every race of mankind has some protection from light varying with the intensity of pigment. There are no unpigmented races and lack of all pigment—albinism—is, as we have just seen, a serious defect in development due to degeneration.

In considering the possible harmful effect of light upon the eye, it is only necessary then to consider the effect of the shorter waves, the so-called chemical rays named to distinguish them from the heat rays and luminous rays and because they are chemical in action, first stimulating matter and then destroying it. They accomplish this by setting up very rapid molecular or atomic movements, dissociating certain unstable substances without their passing through the lower rates of motion or, becoming heated, producing the so-called actinic effect. We are told that as a rule the shorter and more rapid the wave the greater is the actinic effect upon atoms without the production of the slow heat motions of the molecules. Now generally increased movement means more intense activities, and, therefore, as a rule, it could be said that the substance is first stimulated and later ceases its particular activities, but if the cause is more intense and more continued the substance is destroyed.

We recognize that living protoplasm is more or less unstable. It is one of the most complex of substances, and experiments show it is destroyed at a very low degree far below the infra-red and generally far below 212 degrees, though a few organisms can live in boiling water. The protoplasm of the human nerve cell is so very complex and unstable that it will not function except at 99 degrees or 100 degrees F. and is destroyed quickly by a temperature of 120 degrees F., though a temperature of 105 degrees may take some days or weeks to break up the molecules. A study of it shows its base to be of nitrogen, and all nitrogen compounds are noted for their unstability, some even exploding on exposure to light, a slight shaking or a spark. In view of this we must expect protoplasm to be seriously disturbed by vibrations which cause its molecules to move faster than the rate caused by a temperature of about 100 degrees F., and as for the short ether waves, it is reasonable to expect them to destroy protoplasm.

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[7] Journal of Tropical Medicine. September, 1900.

In the experiments showing the effects of light on developing animals, particularly on ova, larvæ of the lower animals or the young of the higher animals, it was found as a general rule that the red-yellow rays have the least effect and in some cases no appreciable effect, but that the blue-violet rays have an undoubted stimulating effect, hastening the time of development. Some animals seem to be adjusted to this stimulation and depend upon it so that when kept in the dark or in red rays their development is retarded. In a few cases no effect was noted by any ray, but the cases are so few in number, and the chances of the protoplasm being protected by pigment of some sort are so great, that there is justification for the conclusion that some effect will be found in every organism in the way of stimulation, which may be so great as to be harmful or fatal even in cases where a slight stimulation is needed. It is known that ants expose their eggs to the light, but for short periods of time only. They will not let them remain out all day unless they wish to kill them.

Both Finsen and Whitmarsh demonstrated that sunburn was caused by the actinic or short rays and not by the long or heat rays. Tanning was Nature's method of preventing these short rays from penetrating blonde skins. In other words, sunburn is a pathological process and is noticeably less in pigmented skins.

That these rays have the power of penetrating quite a distance into our bodies was demonstrated by Finsen prior to 1894. Bordin[8] mentions that they have been shown to pass entirely through, and Drs. W. S. Gottiel and M. W. Franklin proved that they pass entirely through the body if strong enough and affect photographic plates.[9] Repeated experiments have been made to test the penetrability of the skin to violet and ultra-violet light, and the reports are quite discrepant, but when we take into consideration the amount of light, in its concentration, together with the degree of pigmentation, these discrepancies are all cleared up. It has been found that a black skin will stop rays which will pass through a brown skin, and the latter will exclude those passing easily through a blonde skin. The great efficiency of the skin pigment in excluding the short waves is seen in the literature of *x*-rays. J. Rudis Jacinsky[10] shows that the effects of *x*-rays are the same as those of longer rays of violet and ultra-violet, and he further shows that blonde skins will tolerate only short exposures at long intervals, while brunettes seem quite immune to the unpleasant results of erythema and dermatitis. Dr. Carl Beck[11] reports that all who were injuriously affected by *x*-rays were blondes except himself and he escaped several years. At the meeting of the New York Medical Association in 1904[12] there was a discussion by Franklin, Coley, Beck and others of the great damage due to the *x*-ray improperly applied, and one speaker believed that the present situation was truly alarming. Therapeutically the *x*-ray and the ultra-violet are the same.

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[8] National Medical Review, March, 1901.

[9] New York Medical Record, April 9, 1902.

Having shown the harmful effects of these short waves on protoplasm, the question might be asked, "Why is there no ultra-violet nerve sense?" Woodruff in his work on "The Effect of Tropical Light on White Men," in asking this question and answering it, says: "It is an unsolved mystery why there should be no human nerve apparatus to receive impressions from the harmful ultra-violet while we can perceive the slower rates by sight or temperature sense. If the heat sense was evolved because those having it were guided from harmful to beneficial temperatures, why did we not evolve a pain sense to guide us away from the harmful sun's rays—like the ants and lower organism generally? The only hint we have is in the supposition that man and his ancestors evolved in dark, rainy, misty, cloudy regions. Such an atmosphere is proved to filter out the ultra-violet, and even to-day, though they are very powerful at mountain tops, they are mostly destroyed by the atmosphere before they reach the valley. Hence there was no nerve sense evolved, as there was no need of it: but evolution later took the direction of throwing out a pigment, and this resulted in a survival of the pigmented and the death of the unpigmented. When ultra-violet did enter the environment it was too late to evolve by variation a new nerve sense and survival could again occur only in one way—that is, by excluding the harm which was not sensibly appreciated. Hence our present ignorance of the injury we receive when out of our proper zone. It is to be noted also that life arose in the ocean where the ultra-violet rays can not penetrate, and that terrestial life was impossible without similar protection from this unforeseen danger."

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[10] New York Medical Journal.

[11] New York Medical Record, Jan. 13, 1900.

[12] New York Medical Record, Dec. 3, 1900.

That sunlight is not absolutely necessary to lower animal life, and, in fact is avoided in many instances, probably because of the harmful rays, is shown by a study of their habits. The vast majority of land animals live in absolute darkness, in the soil in cracks of rocks, crevices, trees, caves, burrows and under boulders, some never coming to the surface at all. Some spend the days hiding from the light and come out only at night. If any animal ventures abroad in the daytime we find that it is provided with an opaque pigment or covering of some sort whose opacity is directly in proportion to the intensity of the light to be excluded.

### DISTRIBUTION OF PIGMENT IN THE EYES OF ANIMALS AND BIRDS.

We have seen in the color of the iris and the amount of pigment in the retina and chorioid how the organ of sight is protected in man from greater protection in the brunette to less in the blonde and an entire absence in the albino. We find that animals have similar protection, the amount varying with the habits of the animal and the zoological zone in which it lives. As we have observed, man is not confined or does not confine himself to zoological zones. Therefore it becomes of particular interest to study the eyes of the lower animals, arranging them according to their habits and the zones they occupy, and by noting the variations in the amount of pigment present we can draw more intelligent conclusions as to the harm that might follow to the human eye subjected to conditions for which it is not protected.

The anatomy and function of any organ of a higher type can be better understood and appreciated by a thorough study of the same organ in a lower type. This is too often neglected. Woodruff says: "Within recent years it seems as though a mania has taken possession of some biologists leading them to assert that parts whose uses are unknown are useless, and all kinds of theories are built up to account for their survival. All this is wrong and gives rise to protracted controversies waged over conflicting theories based on incomplete observations, controversies which cease on the discovery of the missing facts. The list of characters which are apparently useless will grow less until few or none are left and we will abandon our present theories as to their retention.

Our rule, then, should be to keep on investigating until we do find the use of every character which man possesses and never assert that any one is useless.

The whole future trend of anthropology is now in the direction of finding out the use of every separate variation. It is hoped that this inquiry proves that human pigmentation has a use and a vital one as described by von Schmaedel, and is not a useless character.

Most of the work in that division of comparative ophthalmology dealing with the study of the ocular fundi has been carried on by that indefatigable worker, George Lindsay Johnson, assisted by an unusually competent artist, Mr. Arthur W. Head. Dr. Casey Wood, of Chicago, in an excellent article, entitled, "The Mammalian Eye, with Special Reference to the Fundus Appearance,"[13] reviews the work of Dr. Johnson, and in a recent paper on "The Eyes and Eyesight of Birds, with a Special Reference to the Appearance of the Fundus Oculi,"[14] reports some of his own original investigations. As the result of these investigations we find that in each species of animal there is an arrangement of the retinal pigment which distinguishes that animal from all other species; the difference between genera is more marked and the difference between families is even greater.

Dr Johnson has divided the Mammalian fundi, so far as their color is concerned, into three categories: first, the red type, including every shade of red, brown, chocolate and gray. To this class, for example, man and all the primates belong. The yellow type includes all shades of yellow and orange. Good examples of this class are found in those animals having nocturnal habits. Wood, in his description of the fundus of the apteryx, says that, in comparison with that of most of the carinate birds, the fundus suggests its nocturnal life, and adds that "all animals that run about or feed at night time have brilliant yellow-orange, or yellow-red fundi, showing a marked lack of pigment." Johnson's third type is the green and yellow-green, and comprises, among others, most of the carnivora and many of the ruminants. The color of the fundus in many animals, we are told, is determined or modified by the thickened chorioidal or at least subretinal layers known as the *tapetum lucidum cellulosum* (in the carnivora) or fibrosum (ungulata).

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[13] American Journal of Ophthalmology, October, 1905.

[14] Ophthalmology, April, 1907.

As a further protection from strong light, some animals have the nictitating membrane, sometimes called the third eyelid and the umbraculum. Wood describes the nictitating membrane as follows: "The third eyelid found in reptiles, some mammals and commonly seen at vestigal remains in man (plica semilunaris) and the higher apes finds its highest development in birds. It seems to act not only as a scraper of the cornea for cleansing purposes—like the true lid margins—but probably enables some birds, like the eagle, for example, to see through it with a degree of distinctness, even in the blinding sunshine. When in the pursuit of food or when engaged in fighting, the bird may at short notice draw the curtain of the nictitating membrane and thus prevent serious damage to his cornea. When the eye is at rest and the true lids are separated, the avian nictitating membrane shows only at the inner canthus.' Law[15] well described this third eyelid as an "elastic fibrocartilage prolonged at its inner end as a thick prismatic stem and expanded anteriorly into a broad thin expansion with a perfectly smooth, even border, fitting accurately on the rounded surface of the eyeball and covered by the mucosa. Its thick, deep extremity is continuous, with an abundant cushion of adipose tissue, which fills the depths of the orbit and extends between the muscles."

In the marine mammals, such as the seal, whale and so forth, it is absent. Perhaps its chief function is to protect the eye from foreign bodies, but, in view of the fact that it is so highly developed in birds where exposure to bright light is almost constant and absent in marine animals whose life in the ocean protects them from ultraviolet rays, it is possible that one of its chief functions is to protect the eye from too strong light.

The umbraculum is an arrangement of the irides into two distinct layers, the inner stratum being capable of projection into the pupillary space, in much the same manner as an awning is let down in front of a shop window and for the same purpose. This corpus nigrum, or shield to the sensitive retina from the glare of the sun, is fairly well seen in the domestic horse and goat. The best examples occur in the hydrax, the camel and the llama where it is developed into a special organ. In the horse we see it as a simple hypertrophy of the lower pigment layer of the iris. It is somewhat thicker and larger in the wild ass, modulated in the gazelle and goat, and further elaborated in the camel and llama, animals that are the most exposed to light. It forms in the llama a series of dentate projections that fit into one another when the pupil is fully contracted. In the cape hydrax or klip-dass (an interesting animal that resembles in habits and appearance a guinea-pig) we have the most highly developed of these appendages.

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[15] Ophthalmic Record, 1905, p. 440.

In studying the degree of pigmentation of the fundi of lower animals, we find that those living in a tropical country where the light is most intense are provided with a greater degree of pigmentation than those living in other latitudes, the same as with the negro and with the white man. This does not apply to those animals having nocturnal habits living in these zones, for, as we have just stated, all such have brilliant yellow, orange or yellow-red fungi.

ANTHROPOID APES. *Chimpanzee* (Troglodes Niger). Ocular fundus chocolate colored, same as in the African negro.

DOG-FACED BABOONS. *Primates, Simiæ, Cercopithecidæ.*

*Black Ape* (Cynopithecus Niger). Ocular fundus gray and exhibits a well-marked macular ring.

*Diana Monkey* (Cercopithecus Diana) has a dark fur with a large amount of pigment in his body. Dark-gray fundus.

THE LEMURS OR HALF-MONKEYS. *Primates, Lemures, Lemuridæ, Crowned Lemur* (Lemur Coronatus). Fundus is of a peculiar brown or grayish-brown color, stippled at intervals with large dots. *Primates, Lemures, Galagoidæ, Lemur coquereli.* Although all the classifications include this animal and the Galago Monterii among the true lemures, it is evident that ophthalmoscopically there is little in common between them and the lemuridæ. Indeed, it is more likely that these Galagoidæ are not lemures at all, but are more closely allied to the night-prowling carnivora, whose fundi they closely resemble. Coquerel's lemur has a rich golden yellow fundus with a tinge of green and covered everywhere with minute black or brown stellate spots.

*Galago Monterii* has a golden-yellow fundus similar to Coquerels Lemur. Both have nocturnal habits.

THE BATS. *Chiroptera.* The fundus oculi of the Australian fruit bat (*Pteropus policephalus*) is like that of all bats of a uniform pinkish color. Johnson says that this bat's large round pupils act sluggishly to light and mydriatics and that continued exposure to bright light produces blindness.

THE SEALS. *Carnivora. Pinnipedia. Common Seal, Phoca Vitulina.* This fundus, like that of all the carnivora, is brilliantly colored. In this instance, bright yellow, sprinkled with green dots.

BEASTS OF PREY. *Carnivora, Fissipedia, Felidæ.* The *Serval* or *Tiger Cat* (Felis serval). This fundus is a good example of that seen in all the cat tribe, night-prowling animals. Generally there are three distinct, colored zones, the central one occupying about one-third of the whole field. It is light-gold in color, extremely brilliant, and represents the area of best vision. This important zone is surrounded by an emerald-green layer of variable width, while the most peripheral zone is of a dense purple-brown, probably a part of the ora serrata and insensitive to light.

*Carnivora, Fissipedia, Viverridæ, Levaillant's Cynictis* (Cynictis penicillata). This curious little South African animal has a fundus which presents a uniform dark-gray or lead color.

THE MARTENS. *Carnivora Fissipedia Mustelidæ—Common Skunk* (Mephitis Mephitica). This noctural animal's fundus is of a pale canary-yellow, changing to a mottled drab near the lower edge of the disc.

THE HYENAS. *Carnivora, Fissipedia, Hyenidæ.* All the hyenas resemble the cats in fundus coloration. There are three zones—the central, golden yellow; the intermediate green; the peripheral, violet.

THE DOGS. *Carnivora, Fissipedia, Canidæ.* The fundi of all the wild dogs resemble those of the cats and hyenas in exhibiting three highly colored zones—an outside one, reddish or violet brown; an intermediate green area, and a central zone of a bright golden yellow.

*Common Jackal* (Canis aureus). In the fundus oculi of this animal the central *tapetum lucidum* is of a golden color and very large. The intermediate green area is correspondingly small and bordered externally by a narrow violet zone, which runs into the deep purple peripheral zone.

*Carnivora, Fissipedia, Procyonidæ.* The fundus of the *American Racoon* (Procyon lotor) has points of resemblance to both the pole cats and the bears. In all three genera we notice the fundus pigment arranged in a crystalline fashion. The pale, golden-yellow zone has a number of rice-shaped yellowish dots scattered over it. The peripheral zone is partly brown in color. The animal has nocturnal habits.

THE BEARS. *Carnivora, Fissipedia, Ursidæ.* The ocular fundus is about the same in each species and closely resembles that of the raccoon. The fundus pigment has a patchy, crystalline appearance, like coarse sugar, scattered over the background. They pass the winter in a state of torpidity and haunt the recesses of mountains and caverns and the depths of the forest, and are, therefore, not exposed to strong light.

THE RUMINANTS. *Ungulata. Artiodactyla, Ruminantia, Bactrian Camel* (Camelus bactrianus). Fundus is of a uniform chocolate red, and the animal is provided with a well-developed umbraculum.

*Ungulata, Perissodactyla, Equidæ.* Horse, zebra, wild ass, American taper, Indian rhinoceros, African elephant and dorsal hydrax—all belong to the genus perissodactyla. The eyes of the first three may be described as one—that of the zebra—so closely related is their ocular apparatus. The fundus of the zebra (zebra burchelli) is divided into two zones, a peripheral violet-brown zone, deeply pigmented, and a central zone, lying immediately above, stippled with purple-brown, star-shaped spots on a colored ground. All the equidæ have a well-developed nictitating membrane, which they use freely. The pigmented protrusion at the edge of the iris, or *corpus nigrum,* is more highly developed in the wild than in the tame animal and, as frequently observed, domestication affects the coloration of the background; various horses have varied fundus coloring. All the equidæ are exposed to bright sunlight.

*Ungulata, Perissodactyla, Tapiridæ.* The *Brazilian Taper* (Tapirius Americanus), being a night animal, has a bright golden-yellow fundus, which is stippled with orange dots. The peripheral zone is orange red.

*Ungulata, Perissodactyla, Rhinocerotidæ.* The fundus oculi of the *Indian Rhinoceros* (Rhinoceros Unicornus)—an animal specially protected by dermal armor—is certainly primitive. There is little to be seen, except a large, white, round disc in the center of a violet-brown field, which is covered with the same network of pigment. Living, as it does, in the rivers of tropical countries, it is necessarily at times exposed to a brilliant light. It has a well-formed membrana nictitans.

*Ungulata, Proboscidæ, Elephantidæ.* The elephant, both Indian and African, has a yellow-ochre fundus, with bacillus-like markings. It has a well-marked membrana nictitans, but makes little use of it. Its habitat, as we know, is the dense forest, and in its wild state is not exposed to very intense light.

*Ungulata, Hyracoidæ.* Inhabits the rocky districts of Africa and Syria. The fundus pictures of all the hyracoidæ are almost identical, being a reddish-brown, faintly stippled. The *Hydrax* (Hydrax Dorsalis) have a well-developed *corpus nigrum.* Upon exposure of the eyes to bright sunlight it projects downward and forward to the posterior surface of the cornea.

THE RODENTS. *Rodentia, Myomorpha, Muridæ.* The fundus of the *Black Rat* (Mus Rattus) is uniformly gray in color. The white rat has the usual bleached background of the albino.

*Rodentia Sciuromorpha, Sciuridæ. Common Squirrel* (Sciurus Vulgaris). The fundus coloring is a pale pink.

*Rodentia Sciuromorpha Castoridæ. Canadian Beaver* (Castor Canadensis). The fundus is pale brown.

*Rodentia Hystricomorpha, Cavidæ.* The *Brazilian Porcupine* (Sphinguras Prehensilis) has a vermilion fundus, with orange streaks, probably corresponding to large, concealed chorioidal vessels. It is a nocturnal, remaining concealed during the day at the bottom of its burrow, and hibernating during the winter.

*Rodentia Logomorpha Leporidæ.* The *Domestic Rabbit* (Lepus Cuniculus) has a vermilion red fundus, while the white hare has a lake-colored background.

MARSUPIALIA. *Marsupialia Diprotodontia, Mancropodæ. Kangaroo Rat* (Hypsiprymnus Rufescens) has a brownish fundus.

*Marsupialia Polyprotodontia, Didelphidæ. Virginia Opossum* (Didelphys Virginiana). The central zone of the ocular background of the 'possum is of a brilliant golden-yellow, surrounded by a peripheral zone of grayish black, with interspaces through which the golden-yellow color shines. The animal has nocturnal habits.

*Monotremata. Echidna* or *Spiny Ant-eater* (Tachyglossus Aculeatus) of New South Wales. The fundus is of a lavender color throughout.

The study of the fundi of birds' eyes has been much more limited, and this interesting field is yet to be investigated. The work done so far along this line by Dr. Wood shows that the coloration of the fundus in birds does not present that marked variety that one observes in the other subkingdoms, especially among the mammals and reptiles. And in connection with this it is interesting to note that the habits of the different species governing their exposure to light are more similar than the habits of the different species of mammals. Birds' eyes are exposed to intense light during flight. We would, in view of this, naturally expect a well-marked pigment protection, and this is the case with the exception of those having nocturnal habits as far as they have been studied. Wood says: "The fundus is, however, never black, as alleged by some authors, but is generally gray with a suspicion of red—the red color being more plainly seen and variously distributed according to the family to which the bird belongs."

In describing the ocular fundus of the common *Black bird* (Merula Vulgaris) he says: "I have chosen him as a fair example of a quick-sighted insectivorous bird with monocular vision and daylight habits. These are all reflected in his beautiful uniform, bluish-gray fundus, his canoe-shaped, whitish optic nerve entrance and his black-brown, club-shaped pecten."

As an example of a bird having nocturnal habits we will take *Tawny Owl* (Syrnium Aluco). Wood writes as follows regarding it: "The fundus, at first glance, reminds one of a long-haired Caucasian. It is yellowish-red, with chorioidal vessels conspicuous."

*The Cape Eagle Owl* (Bubo Capensis) shows with the ophthalmoscope the same reddish background and the pepper-and-salt area about the disc-like region seen in the tawny oil.

The fundus of the *British Barn Owl* (Strix flammea) is more grayish-red than that of the foregoing.

*The Greater Black-backed Gull* (Larus marinus) has a background that, seen with the indirect image, appears dull-gray. A direct view shows a generally dull-brown, with reddish chorioidal vessels running in a vertical direction. Wood states that the ocular backgrounds of all the gulls examined by him show very little variation.

*The Black Hornbill* (Sphagolobus atratus) has a background of a drab or dull-gray color.

The *Kiwi* or *Apteryx Mantelli,* which has been previously alluded to as a type of bird with nocturnal habits and, therefore, possessing light-colored fundi, shows, upon examination, a background of an almost uniform red color.

Now, the conclusions to be reached from this rather exhaustive résumé of the color of the fundi of various mammals and birds is that, in the majority, the amount of pigment in the fundus and iris and the presence of a nictitating membrane and corpus nigrum is directly in proportion to the intensity of the light to be excluded.

## EYE INJURIES FROM LIGHT.

Owing to the many modifying factors it is almost impossible to secure clinical data that will prove the theories advanced, and in summing up the possible harmful effect of light on eyes not provided with sufficient pigment protection one can only speak in a general way.

Stockhausen's[16] investigations show that the greatest amount of light that the human eye can stand is a surface brightness of 0.75 of a Hefner candle to the square centimeter.

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[16] Wochnsch. f. Ther. u. Hygiene d. Auges. Oct. 3. 1907. Vol. xi. 1. p. 4.

William Rollins[17] mentions numerous cases of permanent injury to the eyes, and even blindness, due to *x*-rays, and details the extreme precaution to be taken by operators. This applies to radium rays and also to the violet and ultra-violet.

Prof. A. Birch-Hirschfeld of Leipsic reports the anatomical findings in an eye which had been exposed to prolonged radiation during the treatment of carcinoma of the temple with the *x*-ray. The principal changes were degeneration of the endothelium and vacuolization in the vessels of the iris and retina. The ganglion cells of the retina showed vacuolization, solution of chromatin, shrinking of the nuclei and cell degeneration. The changes were especially marked in the macular region, where there was pronounced cystoid degeneration. There were no signs of inflammation. He reports other cases,[18] and says that in animal experimentation he noted the slow development of such changes. Selenkowsky, also in experiments with rabbits, has demonstrated the danger of excessive or careless use of the *x*-ray.

Experimenting with the ultra-violet or chemic rays, Strobel found that the media of the eye allow them free passage.[19] It is possible with them to induce a circumscribed inflammation of the retina. Under their influence the iris became hyperemic, inflamed and pigmented. But it is stated that the iris is able to exclude their influence from the deeper tissues. C. Hess,[20] in an article on "Ultra-violet Rays and Their Effect Upon the Lens," reports the result of his experiments. He tried the effect of the uviol lamp upon the lens and found degenerative changes in the epithelium of the lens capsule, with proliferation of the cells near the equator. These changes were observed in frogs, rabbits, guinea-pigs and monkeys. While the degenerative changes did not set in more rapidly in the warm-blooded animals than in the cold-blooded ones, in the former they seemed to be followed by more active proliferation of the cells. The author discusses the bearings which these observations have upon the etiology of glassblowers' cataract. He thinks it possible that the long exposure of the eyes of these men to rays of short wave-length leads to degeneration and proliferation of the cells of the lens capsule; that ultimately the degenerative changes are not able to keep pace with the degenerative processes and so cataract formation begins. He observed that the changes described above did not appear when an ordinary sheet of glass was placed between the animal and the lamp, and so he suggests that glassblowers' cataract might be prevented by suitable spectacles.

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[17] Boston Medical and Surgical Journal, April 2, 1903.

[18] Archiv. f. Ophthalmologie, lxvi, 1.

[19] The Ophthalmic Year-Book, 1904, p. 196.

[20] Arch. f. Augenheilk, Mai, 1907.

Woodruff states that eye diseases cause 15.47 admissions per 1,000 to our sick report in the United States, but in the Philippines it is 18.89.

*The Medical Review* is quoted as stating that Professor Ferne has found "that exposure to the sun's rays produces symptoms of many diseases which persist for days after the exposure. This congeries of symptoms seems not very formidable, yet it induces the author to conclude, from the observed coincidences of meteorological conditions and certain diseases, that exposure to the sun's rays is a predisposing factor in coryza, influenza, hay fever and epidemic meningitis. A curious element is the fact that only 53 per cent. of the persons under experiment found the exposure disagreeable, while the others, notwithstanding the subsequent ill effects, enjoyed it."

Woodruff says, in speaking of the effect of tropical light on the eyes: "We have a disease in the tropics similar to snow blindness, but it is mild, as we never have the great radiation from the ground, such as we receive from the snow. We also have an affection similar to vernal conjunctivitis, which, of course, is merely a mild form of what, in winter, we call snow blindness. In both extremes of temperature, then, either the arctic cold or the tropic heat, it is due to the light, and we can have every conceivable grade of the affection from simple conjunctivitis to paresis of the optic nerve and retina (night blindness) or paralysis and atrophy with permanent blindness. I have examined a case of chronic pigmentary retinitis due to exposure to excessive light in the tropics and a severe case in a signal officer due to work with sun's rays in the heliotrope mirror in the United States." He also says that hemeralopia is often due to overstrain from excessive light, and it is not uncommon in the spring in northern climates when the sunshine becomes intense. He has seen limited epidemics of it in volunteers in the Philippines, and it occurs in our Southern States among the badly nourished. Press reports apparently indicate that in the recent British invasion of Thibet many soldiers were stricken with snow blindness—a country where the natives are so brunette. In Manchuria the same conditions are said to confront the Russians, for the snow glare is so fierce that even the yellow native is occasionally affected and the need of smoked glasses for the Russian soldier is receiving attention. The Japanese, on the other hand, appear to be amply protected by Nature.

Stradler[21] finds that there is a corneal lesion in cases of snow blindness, which corresponds to the size of the palpebral aperture when the lids are almost closed from the glare of the bright light. This corneal lesion he describes as a sort of a sunburn of the corneal epithelium. It is very likely to be overlooked unless fluorescin is used, when this narrow area across the cornea will be found to have taken the stain.

Every now and then a physician has to call attention to the damage done to babies' eyes by exposing them to brilliant sunlight. We find the modern mother actually strapping the poor little sufferer into its carriage and torturing it with the direct rays of the sun pouring down into its face. A short exposure to diffused light, the head being shaded from the direct rays, might be allowed, for the stimulation is undoubtedly beneficial.

Some physicians contend that our school rooms, which are modern "light baths," fully explain the headaches and nerve storms which the children have after a few hours' exposure, and it is an axiom of American ophthalmic practice that slight errors of refraction, which are wholly ignored in Europe, require careful correction in America because of the nervous condition of the people who are injuriously affected by tiny errors, which seem to cause little disturbance in a normal person. The same thing is being found in American school children, an appalling number of whom require glasses for the relief of irregularities which our ancestors ignored.[22]

Stevens, of Denver, is authority for the statement that it is his experience that a mydriatic can not be used for as great a length of time in patients that require it in Denver as in the East, because of the discomfort due to the intense sunlight.

Vernal conjunctivitis or spring catarrh we know to be an affection whose etiology is more or less obscure. The fact that certain skin diseases are caused by exposure to sunlight and the simultaneous occurrence of such skin affections with spring catarrh as observed by Kreibich[23] has led this author to conclude that spring catarrh is due to the agency of the sunlight. The first to act on that theory was Dimmer, who treated a case of spring catarrh by exclusion of light and thereby obtained a good result. Schieck[24]

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21. Ophthalmic Record, November, 1908.
22. Claiborne: Journal American Medical Association, Dec. 10, 1904.
23. Weiner klinische Wochenschrift, 1904, p. 1459.
24. Klin. Monatspl. f. Augenheilkunde, Mai-Juni, 1907.

upholds Kreibich's hypothesis. He, too, saw two cases where the eye was kept covered by a bandage improve considerably. The wearing of dark glasses, however, had not the same effect, because, as Schieck thinks, light is thereby not sufficiently excluded. Pascheff,[25] in an elaborate communication upon the subject, reports 93 cases (83 males and 10 females) which he saw in Sophia, Bulgaria. The symptoms, which were closely dependent upon solar light, appeared with the first heat, diminished in autumn and vanished in winter. Roy[26] says: "The fact that such patients always applied for treatment during the warm months made me recognize the disease as characteristic of this season."

## CONCLUSIONS.

1. That normal eyes possess a greater or less amount of pigment, the function of which is to absorb all rays of light not intended to cooperate in producing vision.

That, as a rule, the amount of pigment in the human eye corresponds with the general coloring or complexion of the individual. Therefore, the eyes of the brunette type are the better protected from the possible harmful effects of intense light.

3. That portion of the human retina, which is the most concerned in vision, namely, the region of the macula, is the best protected by pigment deposits, and this, as we have seen, exists even in the albino, where other portions of the fundus are entirely devoid of pigment.

4. That it is possible that one of the functions of the rhodopsin or visual purple is to protect the delicate nerve tissue of the retina from the harmful effect of light.

5. That pigment does exclude the dangerous actinic rays of light.

6. That the actinic rays are destructive to living protoplasm.

7. That the anatomy and function of any organ of a higher type can be better understood and appreciated by a thorough study of the same organ in a lower type.

8. That the amount of pigment in the eyes of animals and birds and the presence of other structures to protect the eyes from light varies with their habits and the zoological zone they occupy.

9. That owing to the many modifying factors it is very hard to secure clinical data that will prove the theories advanced, but that light does injure the eyes we have ample proof, and it is possible that some of the eye diseases whose etiology is at present obscure may find their explanation in this way.

10. That vernal conjunctivitis or spring catarrh is conceded to be a disease dependent more or less upon the harmful effects of solar light.

11. That in view of the fact that glass stops the ultra-violet light, while quartz allows it to pass through, we have in the wearing of glasses a protection from the harmful rays.

12. That all of the above facts show the great necessity for pigments in the iris, retina and chorioid and that the density of the pigment must be in proportion to the degree of light to which that type of man is exposed.

# CAUSES AND TREATMENT OF LACRIMAL DISEASES.

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Dacryocystitis, or inflammation of the lacrimal sac, is one of the most difficult diseases to obtain a permanent cure that the oculist is called upon to treat. The mere fact that the vast majority of cases are allowed to progress without attention until an acute abscess or total occlusion reminds the patient that something is radically wrong and should receive attention is proof of the above statement. A cure is expected in a few days. When it is explained that probably treatment will extend over a long period and must not only be persistent but may also be painful, the unhappy patient seeks other advice, and often changes to another physician, especially if a cure is promised in a short time, as is often the case by charlatans or advertising doctors.

The lacrimal sac is one of the four divisions or parts of the lacrimal apparatus. The lacrimal gland, with its two divisions, superior and inferior, which empty their secretions into the eye at the upper and external fornix, is the first division.

The sewage or drainage of the secretions supplied by the first or glandular system of the eye begins with the punctum lachrymalis, or entrance of the lacrimal ducts, one in either lid, extending inward and joining together, forming the common duct which enters the lacrimal sac.

The third part, the lacrimal sac, lies in the inner and lower part of the orbit in a groove called the lacrimal sulcus, which presents a smooth, concave, longitudinal surface. The free margin unites with the nasal process of the superior maxillary bone which completes the lacrimal groove, the upper part of which lodges the sac and the lower the nasal duct.

The tensor tarsi muscle and the internal palpebral ligament pass external to the sac. The sac proper is about twelve to fifteen millimeters in length and five to six in width, unless dilated from long continued distention. The upper extremity of this sac is oval and dilated larger than it is below, gradually becoming smaller until it enters the nasal duct. Here is the smallest caliber of the duct. It gradually dilates as it passes from the entrance of the lacrimal canal and empties into the nose. The sac is covered externally by a fibrous expansion derived from the tendo oculi.

The fourth division of the apparatus is the nasal duct, which is narrowed down to a caliber of about two to three millimeters. It extends from the lower part of the lacrimal sac to the inferior meatus of the nose, where it terminates by an expanded orifice, or, as Gray says, "It is provided with an imperfect valve formed by the mucous membrane."

The entire inner surface of this canal and sac is lined with a columnar epithelium similar to that of the nose. The point of constriction at the entrance of the duct is the location where we have the most trouble with stenosis.

The causes of diseased conditions of these structures are manifold. Discharges from infected conjunctivæ and external infection entering through either extremity of the canal from eye or nose are frequent causes, those from the nose being in the vast majority. Occlusions of either end, from malformation or malposition, or pressure on the punctum or on the canal at its nasal opening. It is especially due to pressure made by some growth or hypertrophic tissue in the nose. As has often been said, investigate the nasal cavities thoroughly before making a diagnosis.

All writers agree that the nose is the chief offender in the causation of this disease. The nose, therefore, should be very carefully inspected and, if possible, the offending focus of infection or pressure from hypertrophied tissue or growth should be removed. Malposition of duct or of the turbinal, along with diseased conditions, often occlude, and if it is removed and the exit made free the mucocele or inflammation of the sac can then be treated by mild antiseptics. Conservative treatment is always to be adopted and persisted in until a cure is obtained or until we are certain of its inability to effect a cure, unless circumstances as hereafter mentioned alter the case.

The old-fashioned slitting of the canaliculi at first treatment, followed by the introduction of probes, is only mentioned to be condemned, especially the very large probes such as were advocated a few years ago. The No. 5 Bowman is the largest necessary. The probes, if necessary to be used, should be introduced through the canaliculus after it has been stretched or dilated with a graduated dilator until the largest probe necessary can be introduced into the sac and then forced through the duct into the nose. A 2 per cent. solution of cocain injected into the sac and some dropped into the conjunctival cul-de-sac will oftentimes render this procedure nearly painless. The tract should be thoroughly cleansed by injecting with a lacrimal syringe some mild antiseptic solution, care being taken not to use great force, and we should be certain the blunt needle is introduced into the sac, otherwise great damage can be produced by injecting the solution into the tissues, especially if argyrol or some silver salt be used. I have seen argyrosis produced by injecting argyrol, which remained permanent, nearly wholly surrounding the eye, causing very great discomfort to both patient and physician.

If necessary to slit the canaliculus, the lower one is usually chosen, unless scars from some injury or malformation are present. If so, then use the upper one. Small probes, even a No. 1, carefully inserted will often open the canal so that irrigation will complete the cure by reducing the inflamed and thickened tissues.

Thorough cleansing and drainage must be the object sought in all cases. While the above treatment carefully carried out over a period of weeks is often successful, we have so many failures that a newer, better and quicker method has been sought. This, I believe, in properly selected cases has been found in the extirpation of the sac.

I wish to give due credit to Professor Meller of Fuch's clinic, Vienna, for the method of removing the sac. Therefore, I have used freely my notes that I took when under his tutilage in Vienna. His new work has the operation fully and completely described, but this paper was written before it came from the press.

A few laws governing this operation should be rigidly observed or failure will be the result as in former treatment.

First.—Never operate on an acute dacryocystitis.

Second.—Never operate until milder and more simple means have failed.

Third.—Never operate during active syphilitic invasion.

Again, we have many cases that come under the following lists which can not have an extended period of treatment. I make it a rule to operate on the following classes of patients:

First.—Cataract patients who come from a distance and have neither the means nor opportunity for taking a long extended course of treatment before operation.

Second.—Nervous or hysterical patients who are unable to bear the passage of probes or even the use of the syringe. (One man I now recall fainted and was so sick he had to be removed to his home in an ambulance every time either a probe or a syringe was introduced.)

Third.—Children who are practically unmanageable, causing not only an endless amount of bother but also a liability of injury to themselves by resistance.

Fourth.—Long persistent cases that have not responded to careful treatment.

Fifth.—Traveling or transient patients who are compelled to be under a new physician's care almost constantly, thus running the risk of neglect and greatly increasing the expense.

Sixth.—Persons living in rural districts and unable to be away from home for extended periods and financially unable to return to the oculist.

Seventh.—Where ulcer of cornea is present and does not respond to treatment.

Eighth.—Where there are malignant growths in the sac.

Ninth.—When one eye has been lost and a constant discharge from the sac endangers the remaining eye.

The removal or extirpation of the sac, many operators say, is one of the most difficult operations that the oculist is called upon to perform and, therefore, necessitates an exact knowledge of the anatomy, as well as absolute care that all the field is rendered as near aseptic as possible. Not only the external surfaces should be rendered clean, but also the contents of the sac evacuated by injecting antiseptic solutions, thereby leaving as little cause for infection as possible.

In Fuch's clinic Dr. Meller makes it a rule never to operate under a general anesthetic, except in very small children and neurasthenics who will not bear operating under local anesthesia. During my stay with him I saw him operate twenty to twenty-five cases all under local anesthesia. The hemorrhage is so much greater under the general anesthetic that he advises against its use in every possible case. If the injection of the anesthetic is done as directed, closely following every detail, there is no probability of the patient suffering.

The anesthetic should be begun by dropping a few drops of a 4 per cent. solution of cocain into the conjunctival sac, then the field of operation and conjunctival surface should be thoroughly cleansed. Next dilate the canaliculus with a graduated probe large enough to allow the lacrimal needle to be inserted easily. A 4 per cent. solution of cocain with one-tenth its amount of adnephrin or adrenalin should be injected into the sac. The patient should be lying as nearly on his face as possible so that this solution will not flow down the throat. After the sac has been anesthetized in this manner it should be followed by syringing with a mild solution of bichlorid or permanganate. A 1 per cent. solution of cocain with the same amount of adnephrin as the above solution should then be injected over and beneath the sac. The needle should be inserted through the skin beneath the tarsal ligament and about four to six minims of the solution injected. The needle now should be inserted above the tarsal ligament down until it strikes the bone, then turned slightly laterally and the same amount of the solution injected slowly. If the needle has penetrated the sac the solution will flow from the canaliculi. If such is the case the needle should be withdrawn and inserted in another direction so that the solution will be placed beneath the sac. The third injection should be immediately over the entrance of the nasal duct and should be injected deeply, as in the second injection. If this technic has been followed the field will be thoroughly anesthetized as well as rendered nearly bloodless.

Have the patient close the eye and keep it closed during the operation, that the tissues may not be drawn tense. Locate the crista and make the incision through the skin about one millimeter internal to its crest. This incision may vary in length, according to the depth required to reach the sac or according to the skill of the operator. A skillful operator can do the work through a very small opening. Do not stretch the lid. The incision should be made slightly curved, from two to three millimeters above the level of the internal canthus, downward and outward about twelve to fifteen millimeters, following the curve of the crista. Do this with a sharp, thin knife. After the skin is incised, dissect it back three or four millimeters, then control the hemorrhage that is present. Often this bleeding from the veins of the skin will be the only hemorrhage you will encounter.

The superficial fascia will then be in view. Before incising this place your retractors in the wound so they will hold the skin completely out of your way. The external fascia should then be divided with the aid of the scissors and retracted the same as the skin. The same will be true of the orbicularis muscle. Do not use the knife to dissect the muscle back. The point of the scissors or a small, blunt dissector is much to be preferred and not likely to cause so much hemorrhage. You will then encounter the deep fascia which covers the lacrimal sac. This deep fascia is an extension of the periosteum of the surrounding bones and is quite dense, hard and of an ivory-like hue.

After again locating the crista, either with the aid of the finger or scissors, slit the deep fascia about a millimeter behind the lateral crest, care being taken that the scissors do not enter the sac at the same time you are slitting the deep fascia. Through this opening you will see the bluish colored sac, and by careful dissection you will be able to loosen it both internally and externally along with the periosteum. When the dissection is completed, the sac loosened at both ends, seize it with strong forceps and cut the ligamentous attachment at the upper angle. You may encounter some hemorrhage at this point. but you have the sac completely in view and will be able to control the bleeding by pressure. When the sac is loosened from above, with the scissors dissect down to the entrance of the duct and excise as low as possible: then, after the injection of a little more cocain, the canal should be thoroughly curetted, leaving no mucus surface remaining in the nasal duct. This will insure closure of the duct in its entire length. Now inspect your surface to make sure that all the sac has been removed. If any part of it remains there will be a fistula resulting and it will necessitate another operation to remove the remaining membrane. and I assure you this will be more difficult than the original operation.

Some operators advise slitting the canaliculi and destroying the mucous membrane of the canals to avoid a blind sac in this region. I have had no trouble in this line and shall not go to this extremity unless I find more reasons than I now have. From my experience there has been no trouble at all with the remaining closed lacrimal ducts.

After removing the sac the incision is closed by three deep and four or five superficial sutures. If carefully coapted no scar will be noticed. A small compact of gauze is now placed over the wound and held in place by a tight bandage. This last procedure is very important. since there must be a complete control of hemorrhage in the cavity. Very firm pressure may be uncomfortable to the patient but must be insisted on to obtain the best results. As a rule. if your technic in asepsis has been without fault, the wound heals by first intention and the stitches can be removed in four or five days. The resulting scar, if no infection has taken place, will be scarcely noticeable after a few days. I wish to insist again never to operate in acute cases. If pus has formed, drain as you would an abscess and treat until the acute symptoms are relieved. then operate as above.

The epiphora will probably remain to some extent for six to eight weeks. After this the patient will probably have no evidence of excessive amount of lacrimation. From the best statistics that I can obtain, and from my own cases, about 6 to 8 per cent. of sac removals will continue to have excessive lacrimation. It is to be understood that any conjunctivitis or other irritation about the eye must be removed. Also all strain, such as errors of refraction, etc., will have to be corrected. If the epiphora still remains after several weeks then the removal of the lower lacrimal gland is a justifiable procedure; I should say never do this when you operate on the sac, since the per cent. of cases where it is necessary is so very low.

The method of operating on the lower or inferior lacrimal gland is simple and easily done—a double roll of the lid; that is, inverting the lid as we do to inspect the conjunctiva, then grasp the inverted lid with a broad, smooth thumb forcep and make a second roll—that is, turn the thumb forceps up until the lid is rolled the second time on itself. This should be held by an assistant. Then incise the conjunctiva under local anesthesia and dissect it up, exposing the gland. The fascia and muscles need not be disturbed in this operation. After the gland is removed the conjunctival wound is closed with two or three catgut sutures. The removal of this section of the gland will, as a rule, cause atrophy of the upper gland and the epiphora will then cease. In case of failure to control the epiphora, which sometimes happens, the entire gland will have to be removed. This is a more serious operation, since the orbital tissues are exposed and operated upon by opening from the external surface through the tissues until the gland is exposed. The technic of this operation will not be taken up in this paper.

The question will naturally be asked, "what becomes of the tears when the sac is removed"? In answer, "The sac removal has an indirect action on the secretion of the lacrimal gland which causes the flow to cease." Then the query will come, "Will not the eye be too dry without this flow of tears"? No, this is not my experience nor the experience of those who have operated a great many times. The other glands of the eye furnish abundant lubrication for the required moisture of the eye and no inconvenience from the lack of tears is noticed.

# OPHTHALMIC GOITER.

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It is with considerable trepidation I enter upon the discussion of this subject, especially since I can not agree with such high authority as Prof. Lewellys F. Barker of Johns Hopkins University, who says: "In the present state of knowledge and practice, therefore, once a positive diagnosis of exophthalmic goiter has been made, it is, in my opinion, the physician's duty and privilege to recommend operation early."[1] In discussing a paper read by Dr. Roswell Park a few years since, before the Cleveland Academy of Medicine, in which he urged the operation of thyroidectomy as a life-saving one, and pictured, as only his facile pen can do, the horrible death which almost inevitably was sure to overtake these unhappy patients, I was incautions enough to remark that the only deaths I had ever seen from exophthalmic goiter were on the surgeon's table, and that the natural tendency of the disease was to recover in from one to five years. I was so severely criticized for this statement that I was stimulated to tabulate the late history of some of the cases that have come under my observation. This compilation was undertaken without any reference for publication, but, as it has appeared very instructive to me, I thought it might also interest the members of the Academy. I might have tabulated a much larger number of cases if I had included mild ones, recent ones, or those of doubtful diagnosis, but the object I had in view in this research was to discover, if possible, what became of the severe cases in which there was no question as to diagnosis. All the cases here tabulated had tachycardia, enlarged thyroid, and the exophthalmos in nearly every case was very great—such cases as would naturally consult an ophthalmologist. They are almost exclusively compiled from my private case books.

*Tinnitus Aurium.*—At one time I thought this was one of the numerous symptoms of the disease, but, like errors of refraction, the progressive impairment of hearing was what kept these patients under my observation long after the exophthalmic goiter had disappeared. I believe, however, that in all cases of Graves' disease

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[1] Jour. A. M. A., Oct. 12, 1907.

| No. | Age. | Sex. | Year. | Refraction. | Exciting Cause. | Remarks. |
|---|---|---|---|---|---|---|
| 1 | 19 | F. | 1900 | L. — 0.25 ax. 180° V. 20 xx.<br>R. — 0.25 V. 20 xx. | School. | Recovered when taken out of school. |
| 2 | 10 | F. | 1900 | L. — 1.00 + 3.50 ax. 90° V. 20 xxx.<br>R. — 1.50 +3.00 ax. 100° V. 20 xxx. | School. | Recovered in two or three years. Precocious child. Menstruating. |
| 3 | 30 | F. | 1901 | L. + 0.50 + 0.50 ax. 90° V. 20/xx.<br>R. + 0.75 + 0.50 ax. 105° V. 20 xx. | Broken engagement. | Tinnitus aurium — progressive deafness. Recovered. |
| 4 | 22 | F. | 1885 | L.<br>R. | Love affair. | Recovered after marriage and childbirth. |
| 5 | 42 | M. | 1895 | L.<br>R. | | Exophthalmus of left eye only. Recovered from all symptoms except the exophthalmus. |
| 6 | 20 | F. | 1905 | L. — 1.00 ax. 180° V. 20 xx.<br>R. — 0.75 ax. 15° V. 20/xv. | | Recovered in one year. |
| 7 | 18 | F. | 1896 | L. + 3.00 + 0.25 ax. 90° V. 20 xx.<br>R. + 2.75 + 0.25 ax. 90° V. 20/xx. | Disappointment. | Recovered after marriage. Three healthy children. Died few months ago, fourth childbirth. |
| 8 | 17 | F. | 1905 | L. + 2.00 + 3.00 ax. 90° V. 20 xl.<br>R. + 3.00 + 3.00 ax. 90° V. 20 xl. | School. | Recovered in six months. |
| 9 | 23 | F. | 1895 | L. + 5.00 ax. 90° V. 20 xxx.<br>R. — 2.00 + 5.00 ax. 110° V. 20 xl. | | Recovered after marriage. |
| 10 | 10 | F. | 1899 | L. + 1.50 ax 90° V. 20/xx.<br>R. + 1.25 ax. 90° 20 xx. | School; fiancé died. | Recovered. Had two or three relapses. |
| 11 | 17 | F. | 1892 | | | Recovered after marriage and childbirth. Three healthy children living. |
| 12 | 19 | F. | 1899 | L. — 0.50 + 2.50 ax. 90° V. 20 xx.<br>R. — 0.50 ax. 1.05 V. 20 xx. | School examination. | Suddenly during college examination. Had relapse during second examination. Has fully recovered. |
| 13 | 34 | F. | 1902 | L. + 0.50 + 0.50 ax. 90° V. 20 xx.<br>R. + 0.75 ax. 90° V. 20 xx. | | Recovered in two years. |
| 14 | 29 | F. | 1903 | L. — 0.50 V. 20 xxx.<br>R. — 0.50 V. 20 xxx. | Grief. | Recovered after marriage two years later; two healthy children. |
| 15 | 37 | F. | 1897 | L. + 0.75<br>R. + 0.75 ax. lx. | Financial worry. | Recovered in three years. Enlarged cystic thyroid persists. |
| 16 | 17 | F. | 1905 | L. — 0.75 + 4.50 ax. 100° V. 20 zx.<br>R. — 0.50 + 4.00 ax. 75° V. 20 xxx. | | Recovered. Tinnitus aurium, progressive deafness. |
| 17 | 16 | F. | 1902 | L. + 0.75 + 0.25 ax. 90° V. 20 xxx.<br>R. + 0.75 + 0.25 ax. 90° V. 20 30. | School. | Recovered in one year. |
| 18 | 30 | F. | 1902 | L. + 1.25 ax. 75° V. 20/xx.<br>R. + 0.50 ax. 75° V. 20 xx. | | Recovered slowly. |
| 19 | 18 | F. | 1892 | | Broken engagement. | Recovered within a year after commencing to study medicine. |
| 20 | 25 | M. | 1897 | | | Twin brother of number nineteen (19) much improved. |
| 21 | 53 | F. | 1898 | L. — 4.00 — 1.00 ax. 180° V. 20 xx.<br>R. — 4.00 — 0.50 ax. 30° V. 20 xx. | Worry. | Still has exophthalmus and tachycardia when worried. |
| 22 | 21 | F. | 1900 | L. — 0.75 — 0.25 ax. 9° V. 20 xx.<br>R. — 1.00 V. 20 xx. | | Recovered. Daughter of twenty-one much improved, but has had several relapses. Teaching school every day. |
| 23 | 37 | F. | 1902 | L. + 9.25 V. 20 xv.<br>R. + 0.25 V. 20/xv. | | |
| 24 | 25 | M. | 1904 | L. + 4.00 + 2.00 ax. 90° V. 20 xx.<br>R. + 4.00 + 3.00 ax. 90° V. 20 xx. | Disappointment. | Thyroidectomy; died from operation. |
| 25 | 12 | F. | 1904 | L. + 1.75 ax. 90° V. 20/xx.<br>R. + 1.25 ax. 90° V. 20 xx. | School. | Recovered in two years. |
| 26 | 21 | M. | 1896 | L. + 1.50 ax. 90° V. 20 xx.<br>R. + 2.00 ax. 90° V. 20 xx. | Civil service examination. | Recovered in one year. Now holds important position in Forestry Department U. S. |
| 27 | 43 | F. | 1894 | L. + 0.50 ax. 90° V. 20 xx.<br>R. + 0.50 ax. 75° V. 20 xxx. | Grief. | Exophthalmia so great that lids had to be sutured to protect cornea. Recovered in two years. |
| 28 | 42 | F. | 1896 | L. + 2.75 V. P. L.<br>R. + 2.75 ○ + 1.00 ax. 75° V. 20 xl. | | Perforating ulcer cornea, right eye. Large ulcer of left. Large pieces of edematous conjunctiva removed before lids could be closed with sutures. Recovered in six months. Good health eleven years. Died from pneumonia. |
| 29 | 20 | F. | 1890 | | Broken engagement. | Reported dead. Subsequently learned she had recovered and is now a nurse in good health. |
| 30 | 20 | F. | 1900 | L. — 7.00 — 0.75 ax. 90° V. 20 xx.<br>R. — 7.00 — 1.25 ax. 90° V. 20 xx. | | Recovered in eighteen months. |

| No. | Age. | Sex. | Year. | Refraction. | Exciting Cause. | Remarks. |
|---|---|---|---|---|---|---|
| 31 | 16 | F. | 1903 | L. — 7.00 V. 20/xx<br>R. — 7.50 — 0.50 ax. 90° V. 20/xxx. | School examination. | Recovered in few months. One or two relapses, but promptly recovered when taken out of school. |
| 32 | 57 | F. | 1906 | L. + 1.25 V. 20/xx<br>R. + 1.00 V. 20 xx. | | Serous exophthalmus. Great chemosis; thought would be necessary to close lids with sutures, but was able to protect cornea with adhesive strips. Recovered in six months. |
| 33 | 40 | F. | 1901 | L. + 1.00 V. 20 xx<br>R. + 1.00 V. 20/xx. | Marriage unhappy. | Recovered from thyroid enlargement and tachyardia, but still some exophthalmus and tremor. |
| 34 | 41 | M. | 1903 | L. + 1.50.<br>R. + 1.50. | | Thyroidectomy; died. |
| 35 | 19 | F. | 1887 | | Broken engagement. | Ulcer of cornea both eyes. Lids closed with sutures. Confined to bed six months. Recovered and died three years ago from pneumonia. |
| 36 | 22 | F. | 1901 | L. + 2.50 ax. 75° V. 20/xx<br>R. — 0.75 ax. 125° V. 20/xx. | | Much improved after marriage. Relapse year ago. Still under observation. |
| 37 | 24 | F. | 1901 | L. + 0.25 + 0.25 ax. 90° V. 20 xx.<br>R. + 0.75 + 0.50 ax. 90° V. 20 xx. | | Recovered in three years. Tinnitus aurium—progressive deafness. |
| 38 | 21 | F. | 1905 | L. + 3.00 ax. 70° V. 20/xxx<br>R. + 1.00 — 3.25 ax. 20° V. 20 xxx. | Worry. | Married six months ago. Great improvement since. |
| 39 | 19 | F. | 1894 | L. + 0.25 ax. 90° V. 20/xx<br>R. + 0.50 ax. 90° V. 20/xx. | Broken engagement. | Improved slowly, but recovered at the end of five years. |
| 40 | 23 | M. | 1903 | L. + 0.75 ax. 90° V. 20 xx.<br>R. + 1.25 ax. 90° V. 20 xx. | School examination. | Recovered. Relapse two years later under school examination. Thyroidectomy. Aphonic since. Exophthalmus still present. Condition otherwise satisfactory. |
| 41 | 21 | F. | 1903 | L. + 1.00 + 1.00 ax. 105° V. 20 xx.<br>R. + 0.50 + 0.50 V. 20/xx. | School examination. | Recovered in two or three years. Happily married. |
| 42 | 50 | M. | 1903 | L. + 1.50 + 0.50 ax. 90° V. 20 xx.<br>R. + 1.75 + 0.25 ax. 90° V. 20/xx. | Anxiety and loss of sleep | Physician dissuaded from thyroidectomy with difficulty. Recovered in two or three years. |
| 43 | 20 | F. | 1895 | L. + 2.25 ax. 90° V. 20 cc<br>R. + 1.25 ax. 90° V. 20/xx. | Broken engagement. | Ulcer cornea of left eye. Inserted three sutures outer canthus of left and two in right eye to protect cornea. Still considerable enophthalmus, but general condition satisfactory. |
| 44 | 20 | F. | 1902 | L. — 1.25 — 0.25 ax. 90° V. 20 xx.<br>R. — 1.25 — 1.00 ax. 105° V. 20/xx. | | Thyroidectomy. Died during operation. |
| 45 | 35 | F. | 1901 | L. + 0.75 + 0.50 ax. 90° V. 20 xx.<br>R. + 1.00 + 0.25 ax. 90° V. 20/xx. | | Still great exophthalmus, but general condition such that she conducts a large business in a neighboring town. Canthoplasty was made to protect cornea. |
| 46 | 21 | F. | 1898 | L. — 1.00 — 0.50 ax. 5° V. 20/xxx.<br>R. — 0.75 — 1.00 ax. 150° V. 20 xxx. | Broken engagement. | Recovered after marriage. Two children. |
| 47 | 50 | F. | 1903 | L. —<br>R. | | Exophthalmus still present. Condition otherwise satisfactory. |
| 48 | 40 | F. | 1904 | L. + 1.75 V. 20/xx<br>R. + 1.50 V. 20/xx. | Financial worry. | Condition much improved. Holds important position as bookkeeper. |
| 49 | 16 | M. | 1900 | L. + 0.50 + 0.50 ax. 140° V. 20/xx.<br>R. + 0.50 + 0.75 ax. 30° V. 20/xx. | School. | Developed slowly. Recovers when he leaves school, but relapses after three to six months' school work. Has had at least three such relapses. |
| 50 | 24 | M. | 1906 | L. + 0.50 — 1.25 ax. 90° V. 20/xx.<br>R. + 0.25 — 1.25 ax. 90° V. 20/xx. | Employer insane. | Recovered while employer was sent to institution. |

complicated with middle-ear disease the noise is greatly aggravated. A number of cases of commencing exophthalmic goiter first consulted me on account of tinnitus aurium.

*Errors of Refraction.*—I have not attempted to analyze the refractive errors in these cases, but present them for your consideration. The frequency and amount is suggestive of some etiological relation, although too much stress can not be given to these tables. It was because these patients had errors of refraction that I was enabled to keep them under observation for so many years.

*Marriage and Childbirth.*—My observation that a happy marriage and childbirth has had a very beneficial influence upon the course of the disease is an old one. Gowers has also noticed the improvement after marriage and childbirth.

*Exciting Causes.*—In at least 29 of these cases the exciting cause could be traced to some mental shock, either the stress of school life, broken engagements, financial loss, or worry of some kind. I am sure a larger percentage could be traced to similar causes if attention had been more specifically directed to this etiological factor. According to S. P. Beebe,[2] "there are two commonly accepted possibilities which explain the origin of the hyperactivity of the gland: first, as a result of nervous shock; second, as a compensatory hypertrophy during a toxemia." As to the first possibility, the investigations of the last ten years have given us a fund of information concerning the remarkable control exercised by the nervous system on glandular activity following an apparently insignificant stimulus. We have no direct experimental evidence to indicate in how far we can apply these results to the thyroid gland, but clinically we see many instances of marked change in the activity of the gland following some profound nervous disturbance. The condition may have been latent before, and first becomes evident following some severe fright or sudden sorrow. Why the effect should last beyond the stimulus which called it out we do not know. That a new habit of abnormal activity may result from a series of repeated stimuli is an hypothesis put forward to account for many instances of physiologic overwork, and it may apply here."

*Prognosis.*—Of these 50 cases, 44 are still living—an average of 8.7 years since first recorded. Three died under the surgeon's knife, one died from pneumonia after eleven years, and another after twenty years, one in childbirth twelve years after the disease was first noted. None of them died from the disease or any complication *per se.* I am fully in accord with the observation of the older clinicians, that the natural tendency of the disease is to recover. Many of these cases, even the most serious ones, recovered so completely that there was no trace of the disease to be discovered. Others, while they still have a slight exophthalmos, and may have a slightly enlarged thyroid, and perhaps show a slight tremor under excitement, and their nervous system may not be quite so stable as in a person in perfect health, yet they enjoy life, perform all the duties of a good citizen in private and public. They successfully fill their place as artisans, professional or business men and women. They make good homes and raise healthy children, and may be good life-insurance risks. I have not had the opportunity of examining exhaustive statistics by writers other than ophthalmologists on this subject, but, judging from the statements of various authors, there must be considerable guesswork. Posey[3] says: "Exophthalmic goiter is seldom fatal." Hare:[4] "A certain number of cases undoubtedly recover, but a certain number are always liable to relapse." R. W. Wilcox[5] says: "The prognosis is usually good as to life, but recovery is rare in patients in whom the disease is well marked and has persisted for a considerable period. Spontaneous cure sometimes takes place in the mild forms. Acute instance of the disease and acute exacerbations of the chronic type of the affection may result fatally within a short time, yet patients in whom the attack appeared suddenly and gave evidence of great severity have gone on to recovery within a few days." Gowers[6] says: "In few diseases of equal severity and corresponding apparent gravity is the prognosis so uncertain or do so few cases end fatally under observation." He calls attention to the prognosis being better in private than hospital patients. Dana[7] says: "About one-fifth of the cases get well or practically well. . . . The duration of the disease in recovering cases is from two to eight years."

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[2] Jour. A. M. A., Oct. 5, 1907, p. 1157.

My observations and the tables herewith submitted lead me to take the more hopeful view, and believe that most all of these patients recover, and confirms me in my optimistic prognosis. The severest cases, those with extreme exophthalmos and tachycardia, the ones whom I put to bed and was obliged to resort to canthoplasty, were the ones that recovered most completely and in the shortest time. I have sometimes thought in recent years that at least a part of the benefit claimed for thyroidectomy might be due to the enforced rest in bed.

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[3] Spiller and Posey, p. 844.

[4] Practice of Medicine, 1905, p. 760.

[5] The Treatment of Disease, 1908.

[6] Diseases of the Nervous System, vol. ii, p. 891.

[7] Nervous Diseases, 1897, p. 537.

*Treatment.*—Although there is no specific in these cases, there is much that can be done for them. During the acute stage rest, mental and physical, is of the utmost importance. Hydrotherapy has proved of the greatest service. Phosphate of soda has been prescribed as routine practice for twenty years. Later in the course of the disease, however, I have found the faradic current of benefit in reducing exophthalmos. Formerly I used galvanism on the enlarged thyroid. When dilatation of the heart is present, strophanthus has served me better than digitalis. Special indications were met as they arose. Iron for anemia, quinin and arsenic for indigestion, and bichlorid for intestinal antisepsis. Errors of refraction are fully corrected. Marriage and childbirth encouraged. Many times I have been the buffer between wretched children and an exacting teacher or a stern parent. I have been father confessor, and have helped to reunite fractured hearts with the most happy results. As I look back over my professional life I can number many of my best friends among my patients who formerly suffered from Graves' disease, and many of the happiest of the homes I know are presided over by my former exophthalmic patients. The truest and best physician is not the one who prescribes for physical ills alone of his patient, but for the mental ones as well, and no one can successfully treat exophthalmic goiter who is not more friend and counselor than one who wields the knife or prescribes pellets.

# ATYPICAL FILAMENTARY KERATITIS.

A. M. MacWhinnie, M.D.

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The prominence of the cornea, its lack of apparent protection and vascularity, its variation of thickness, predisposes this structure to various traumatisms, viz.: mechanical, chemical and thermal, as well as to microbic infection. The thickness of the cornea[1] at the center is .08 mm. and at its periphery 1.1 mm. Result—the corneal lymph spaces diminish from the periphery to the center. Involvement of the periphery, with the attendant inflammation, naturally decreases the size of the corneal spaces, a poor lymph stream and diminished natural resistance resulting. The natural nutrition of the cornea from the aqueous and vascular loops is derived from the episcleral branches of the anterior ciliary.[2] The anterior ciliary comes from the muscular of the ophthalmic artery.[3] Any interference with the proper amount of blood passing through these vessels must, of necessity, diminish corneal resistance—especially the anterior epithelium (region of this form of keratitis). This applies to other parts of the eye as well. The loss of elasticity and exosmosis, properties of blood vessels, increase as the age advances.

Result.—Nutrition in interminal loops must be at a low ebb. The occurrence of this keratitis usually is in persons of advanced age—65 years of age and over, rarely before.[4] In this form we find the epithelial layer and Bowman's membrane only involved. The rest of the cornea remains intact. The epithelial layer is continuous with the inferior surface of the conjunctiva and the external surface of the sclerotic.[5] The assumption may, therefore, be made that there is no idiopathic form of this keratitis, due to the clinical facts cited and to follow. Both of my cases presented evidence of chorioidal atrophy in both eyes. The last case seen, one chorioidal atrophic area, 3x4 mm. in the right fundus, 3 mm. away from the fovea centralis—superiorally and nasally situated—edges ill defined, and one area of chorioidal pigment of the disc side. The

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1. Piersol: System of Diseases of the Eye. Norris and Oliver.
2. Schwalbe: System of Diseases of the Eye. Norris and Oliver, p. 234.
3. Gray's Anatomy, p. 530.
4. Nuel.
5. Minot: Human Embryology, 1892.

same condition prevailed in the left fundus—situation the same, size 2x4 mm. Character of lesions evidently indicated both of the same duration. Examination of the arteries: There was a typical sclerosis, blood pressure 192 Hg., hemoglobin index 90 per cent. Urine negative. The case was seen by Dr. Würdemann, who confirmed the diagnosis and suggested that the blood be examined for the plasmodium of malaria, but the examination did not show the organism.

*Subjective Symptoms.* — Pain, photophobia, a slight weeping and a small amount of pericorneal injection are usually present. In my cases, to all external appearances, both eyes were normal; but one symptom was given by the patient—periodic pain. Vision in each eye equaled .2, which was improved by wiping away the mucoid filaments. Vision then equaled .5. At the raising and lowering of the upper lids, tiny globules from the cornea to the lid margin could be seen for weeks following each eruption on the cornea with attachment thereto (mucoid). These eruptions occurred periodically every four days. Their frequency was diminished by the use of high-frequency currents. Considerable pain occurred with each new eruption, but no pericorneal injection or photophobia, the eruption never taking place in both eyes at the same time. The patient was decidedly poorly nourished and refused any and all internal medication suggested. The movements of the eyelids are supposed to be responsible for the pedicle formation by Bardelli.[6] Sourdille's explanation is that an unequal development of the cells and the different resistance encountered. Leber considers that these filaments are due to products of coagulation, while Uhthoff thought they were the continuation of Bowman's membrane. My two cases warrant me in believing that the filaments are due to the coagulation of the epithelial cells which do not reach the stage of full development—this due to the poor nutrition (diminished interchange of nutritive juices). Either hardened arterial or capillary walls with the resulting lack of cell action, pressure crushing the life of cell's action. Proper amount of this substance would prevent this mucoid change. Further confirmation of these facts: This keratitis is more common in Europe, where the nutrition of the peasant is poor. People there live more economically than in America. Not common in this country, where the poor, as a rule, are well nourished. Often follows injury to the cornea—lime burns, during the course of ulcerative keratitis.[4] The epithelium bears some relation to the parasitic organism known as coccidia seen in the center of the epithelial nests. These coccidia are only found where the nutrition is lower than normal.

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[6] Bardelli: Annali A' Ottalmologia Fasc., 3-4, 1904.

Results and not theories should govern the treatment. Never contravene physiology; scientific treatment always follows Nature. Therefore, base the treatment upon an increased blood supply by means of massage. mechanical preferred, and the use of the high-tension faradic current. Supplement with suitable high frequency, using the proper electrodes. The use of chemicals strong enough to be of any service endangers the cornea proper and is unwarranted. The above measures properly used will not be disappointing.

# TWO CASES OF VOSSIUS' RING-SHAPED OPACITY OF THE LENS.

Harold Gifford, M.D.

OMAHA, NEB.

At the International Congress at Lisbon in 1906, Vossius[1] described 6 cases of a ring-shaped opacity in the anterior capsule of the lens observed after contusion of the eyeball. The opacity, as a rule, can be seen only after dilating the pupil and examining with a strong convex lens. It has a diameter of about 3 mm. and lies centrally, corresponding to size and position of the normal pupil. In two of the cases the ring had a brownish color and could be seen by oblique illumination; in four it could be seen only by transmitted light. In these four under strong magnification it could be seen that the ring was made up of numerous fine dots. This ring disappeared completely in all cases in the course of four weeks, leaving normal vision in all uncomplicated cases. Vossius thinks that the ring is due to the pupillary margin being pressed against the lens by the cornea, producing a brown ring where some of the iris pigment has been squeezed out. The unpigmented ring is probably due to degenerative changes in the capsular epithelium, analogous to the experimental contusion-cataract described by Schirmer (which also disappeared completely).

Since Vossius made this report his cases have been described more completely by Keller in a Giessen dissertation. Cases have also been reported by Krusius,[2] Caspar,[3] Mertz[4] and Natanson[5]—eleven in all. So far as I know, no mention has been made of this condition outside of Germany.

Since my attention was attracted by Vossius' report I have seen two typical cases, and, thinking back, I am sure I have seen several others which I carelessly considered to be cases in which a ring of pigment from the margin of the iris had been left upon the lens capsule.

Case 1.—A girl of 13; struck in the right eye with a stick of wood Oct. 10, 1907. First seen by me October 15. Right eye showed a small penetrating wound of the limbus and sclera, down and out; arteria centralis full of blood; moderate congestion. On the following day I emptied the anterior chamber by a paracentesis. On October 19 the hyphema was nearly gone, and a careful examination with the strong lens showed four small breaks in the upper fourth of the edge of the pupil (atropin dilatation); transmitted light shows a complete ring of opacity nearly one-eighth of an inch in diameter just in the center of the pupil and apparently just within the capsule. This ring was made up of an immense number of very fine dots, the ring itself being about ½ mm. in width. The ring was absolutely invisible when oblique illumination was used: on this account I believe the opacity was within the capsule. After a few days the ring began to break up, and by October 22 it could hardly be seen at all. Vision with correction was 20/xl, there being some slight opacity in the vitreous. Patient not seen again after this date.

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[1] Abst. in Klin. Monatsblätter. f. Aug., 1906. p. 544.

[2] Zeitschrift f. Aug., June, 1907. p. 522.

[3] Klin. Monatsblätter f. Aug., October-November, 1907. p. 425.

[4] Quoted by Natanson.

[5] Klin. Monatsblätter f. Aug., Mai, 1908. p. 537.

Case 2.—Man of about 23; right eye hit by a hard rubber ball two inches in diameter on May 9, 1908. Seen by me May 12, and I found the right eye slightly congested, pupil motionless or nearly so, slightly oval and slightly dilated (no atropin). In the center of the pupillary space, opaque ring, 1/32 of an inch in diameter, plainly visible with transmitted light, but not at all with reflected light and the strongest magnification. Ring made up of very fine dots closely crowded together, while whole visible area of lens, both inside and outside of the ring, is also full of finest dust-like spots, but not so close together as in the ring. Has opaque nerve fibers near the disc, but eye otherwise normal. Vision 20/xv, each eye. Pupil dilates only slightly more on homatropin, and stays oval. The ring began to break up after about a week, and by May 27 most of the lower half was gone and the rest was becoming thinner. On July 17 slight trace of the upper inner quadrant of the ring still to be seen, also a few fine spots in the lens. Vision remains normal. Patient not seen again.

Case 1 is unusual, in that it occurred in a patient with a penetrating wound. The only other case of this sort was that of Natanson, where the injury was caused by a good-sized piece of iron which cut the cornea, but did not stay in the eye. To me the most remarkable thing about the condition is the ease with which the ring could be seen by transmitted light, while it was entirely invisible with oblique light. This suggests that in some cases at least they lie deeper than the capsule itself.

Caspar, also, in describing one of his cases, says that the opacities which were invisible by oblique illumination lay in or at least close behind the capsule. The fine dots seen all through the anterior surface of the lens, in Case 2, I have not seen described by any one else. The nearest to it is the observation of Caspar, in one of whose cases the lens opacity, instead of being a simple ring, could really be seen on strong magnification to be a circular area made up of very fine dots, which were crowded together so closely at the circumference as to give the appearance, at first sight, of a ring enclosing a clear center. These spots, both outside and inside the ring, were probably caused in the same manner as those in the ring itself, by the pressure of the indented cornea, the reason for others occurring in my case being, perhaps, given by the nature of the injury; that is, a sharp blow with a hard small ball.

As to the explanation of the condition, that of Vossius is undoubtedly the correct one, and this view receives confirmation from the observation of Krusius, in whose case a faint gray opacity could be seen on the posterior corneal surface, or on the corneal side of the membrane Descemet at a point corresponding to the opacity in the lens.

# OCULIST AND AURIST, OR OCULIST AND PHYSICIAN—WHICH?

LUCIEN HOWE, M.D.

BUFFALO, N. Y.

The gist of this short communication is illustrated by a remark made some years ago by a young man just beginning the study of medicine. He said he had always liked the idea of specializing. He had decided to take the head as his specialty. I agreed with him that it was wise to limit our field of study, and, showing him the big volume of Helmholtz's "Physiological Optics," with its ponderous mathematical formulæ, I suggested that it might be well to begin with the study of the normal condition of a small part of one of the different organs in the head. In other words, the question which I venture to ask is, which is the more natural and satisfactory object for our work? Is it better to be a well-equipped ophthalmic surgeon and a physician, or aural surgeon and physician with all that that means, or is it better to practice some ophthalmology and some otology and laryngology, and perhaps something of one or two other branches?

This suggestion that our tendency should be to limit rather than extend our field of study may not seem to accord with the purposes of a society whose avowed object is the study of ophthalmology and oto-laryngology. But when the secretary invited me to read a paper, and also left free scope as to the subject, it seemed that a few words relative to basic principles in our daily work, even though of a homiletic character, might be admissible.

There is one proposition upon which we can all agree, that a better knowledge of a subject can be obtained by studying it alone than by dividing that effort between two or more subjects. It is true many a man practices ophthalmology, otology and laryngology with apparent advantage to his patients and credit to himself. But the question before us is rather, could not that same man accomplish these two objects still better by confining himself to one branch? On this point there may be differences of opinion, so let us ask ourselves first whether either of these subjects can be really mastered in a lifetime. To determine this it will suffice to turn our attention to one department of ophthalmology, for example, and see how large a field it is, how important, and how many questions of practical importance arise every day concerning it. Let us consider, for example, the ocular muscles.

Not every one appreciates what an enormous mass of literature has grown up about this subject. One card catalog contains over 2,600 articles relating to it, and the list is far from complete, the part relating to the pathology going back for the most part only about ten years. It is true that many of these articles are repetitions of statements and others are of no earthly use in practice. But when this entire bibliography was recently brought down to 2,000 articles for the purpose of publication, it became a serious question which should be rejected.

The question is, can any one man learn all about even this one department of ophthalmology?

But that is only a part of what we should know about the muscles alone. For we have discovered that the ocular muscles are so related to the stomach and to other organs, and are so affected by varying conditions of nutrition that pathological conditions in other portions of the body must also very frequently be taken into account.

For example, when a patient comes complaining of that indefinite group of symptoms usually called asthenopic headaches, it is impossible to say whether these symptoms are due to some anomalies or lesions in the eyes or in the stomach or in neither of these localities. If on examination we find a decided ametropia or muscle imbalance, we conclude that the difficulty is with the eyes, and prescribe corresponding glasses or suitable treatment. If they do not prove sufficient, those glasses are ordinarily changed once, twice, or several times.

But we all find cases in which even the most accurate correction of the ametropia and of every discoverable symptom of imbalance still proves insufficient. Then the ophthalmologist must ask himself from what other source these headaches and the allied symptoms may come, and his attention is often turned first to the condition of the stomach. Usually he asks some one skilled in gastric examination to ascertain what that condition is, and in due time a report is returned giving the amount of free hydrochloric acid, combined chlorids, presence of rennin, pepsin, etc., etc. But that report means very little to the ophthalmologist unless he has a really good knowledge of the normal process of digestion. Such a knowledge as he gained when a student, perhaps many years before, is quite insufficient to-day. In order to know the significance of the results obtained by modern methods he must be familiar with the main facts, at least, gained by modern investigations in the physiology and pathology of digestion. It is true that the examiner usually accompanies his report with an opinion as to its practical bearing, but as long as the ophthalmologist must rest his own conclusions on the opinion of the gastrologist only a one-sided view of the case is taken. It is here assumed that there is always at hand a gastrologist who can, and also who will, make such examinations, and also that the patient can always pay for them.

In reality we know that physicians who are competent to make these examinations of the stomach contents are not always at hand, and patients can not always afford the extra fee. Under such circumstances the ophthalmologist or his assistant must examine the stomach contents, as he can do, even if roughly. Fortunately, it is not at all difficult to remove the stomach contents, and the titrations and tests necessary to obtain a general idea of the condition of the digestion in a given individual can be done as easily and in much less time than is often devoted to some optical measurements. In other words, we must conclude that in certain cases in which we deal with asthenopic headaches, when the usual treatment, optical and otherwise, does not give satisfactory relief, the ophthalmologist must be fairly well acquainted with modern views of normal digestion. He must at least know what the usual findings mean, or even make those tests himself if no one can do it better for him.

All that has been said thus far concerning the condition of the stomach in one patient may apply to the condition of the kidneys in another, or to the condition of the blood in a third. In other words, in considering asthenopic headaches alone we seem forced to the conclusion that this single class of cases requires the ophthalmologist to be a physician really conversant with modern medicine.

Thus far we have been considering only the ocular muscles. But if we turn to other departments of ophthalmology, many of them will be found at once to be quite as extensive and important as the muscles. Thus the bibliography of diseases of the conjunctiva is probably as large as that of the ocular muscles. We all realize the importance of these inflammations and that many of them are dependent upon disturbances of the general system.

The same may be said of diseases of the cornea. The extent of that field is well illustrated by the fact that our honored colleague, Professor Saemisch, has given a large part of his very useful life to the study of changes in that one membrane.

The importance of changes in the lens is equally great: also that family of diseases which we group together under the general name of glaucoma, and so on with other groups of diseases of the different portions of the eye. Indeed, when we consider almost any one division of ophthalmology we appreciate how impossible it is for a person to master it in a lifetime. Let any one who would challenge this glance even superficially at the portion of Graefe-Saemisch which is now being published. Let him look through the bibliography of any one of its departments, and the idea of knowing thoroughly all ophthalmology becomes absurd—to say nothing of the relation of ophthalmology to other portions of the human organism. Therefore, if we return to our question asking whether it is better to be an oculist and a physician or an oculist and aurist, there can be but one reply. Whether we consider the advantage to the patient or the satisfaction to the practitioner, we find that

"One science only will one genius fit,
So vast is art, so narrow human wit."

In view of this conclusion, I naturally ask myself why it was that when beginning professional work I practiced ophthalmology, otology, rhinology and laryngology, just as many others do still. It was simply another case of my young friend whose specialty was to be the head. Probably the reason was that I knew little and my patients, if possible, knew less. It is true that after graduating in medicine I had studied those subjects under the most eminent teachers in this country and elsewhere, not for a few months, but for a few years. With the confidence, however, born of youth and inexperience, I had not learned how ignorant I was of ophthalmology alone, or of otology alone—certainly of otology with the other two nearly allied branches. In Europe, one seldom or never practices ophthalmology with otology. In our larger eastern cities also a considerable number of our most eminent students limit their practice to one branch or the other. The custom of dealing with both class of diseases is apparently more frequent in our western and southern states than anywhere else. Indeed ophthalmology seems to have less to do with otology than with several other branches. If we think for a moment of the results of syphilis and of gonorrhea, a practitioner might better be oculist and genito-urinary surgeon than oculist and aurist.

If this be true the question arises finally as to the use of a society like ours. There are several reasons for its existence.

First, it broadens the mental horizon of the real specialist. As each of us profits by a wider knowledge of modern medicine, as we attend our state and local societies to listen to papers on the physiology and pathology of the stomach or other organs, or concerning other morbid processes, so are we interested to know more of the pathology of parts of the body near to those with which we have to do every day. But because a student wishes to learn about a territory which lies adjacent to his field, it does not follow that he must also work at all in that adjacent territory.

Second, rivalry in professional work is always a source of interest. The enthusiasm of the student is contagious. Each investigation, each piece of work well done, incites the next man to do better.

Third, the gregarious instinct is a strong bond of union in a society of this kind. Members who have known each other for several years return for the good fellowship which belongs to those whose lines of daily thought are in the same direction. These bonds strengthen as the years increase. It is probable that as the fields of ophthalmology and of otology with its allied branches grow larger, and as the list of our members becomes longer, this society may separate into two or more portions. That is not probable, however, in the immediate future.

But our final conclusion still remains, that it is not well to be an oculist and also an aurist. To become either an ophthalmic surgeon and physician or an aural surgeon and physician thoroughly equipped, means better service to the patient and more credit to the practitioner.

# POPE JOHN XXI, THE OPHTHALMOLOGIST POPE.

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One of the earliest contributions to ophthalmology, in modern history at least, is a little volume called "A Treatise on the Diseases of the Eye," written by Peter of Spain, a distinguished physician of the second half of the Thirteenth Century, who studied medicine at Montpellier and Paris, becoming a professor at the University of Siena and afterward Pope. This little book has a distinct interest and great value, quite apart from its medical significance, because it is one of the earliest books written in the Italian language, and has, therefore, been frequently referred to as an authority on the usage of Italian words by the Academia dela Crusca in the composition of its well-known authoritative dictionary. About ten years ago it was the subject of extended comment by Dr. J. B. Petella, physician-in-chief in the Royal Italian Marine, who wrote several articles with regard to it in *Janus,* the international archives for the history of medicine and of medical geography, published in three languages at Amsterdam.

I have thought that a short account of the man and his work might be of interest to American ophthalmologists. To most people I suppose it will come as a distinct surprise to find that the knowledge of eye diseases should have reached such a stage of development in the Thirteenth Century as to tempt to the writing of a book on this subject. As a matter of fact, however, we owe the foundation of most of our modern progress to the Thirteenth Century, and the beginnings of nearly everything worth while will be found to have come at this time.

During a series of journeys in Europe for purposes of medical study I became interested in the period that saw the foundation of the universities. Practically all of the greater ones were founded in the Thirteenth Century. Paris, Bologna, Oxford and Cambridge are well known, but there were nearly twenty others, and all of them were complete universities with undergraduate departments and graduate departments in law, medicine and theology. This same period saw the greatest development of architecture that the world has ever seen, and most of the famous castles and well-known municipal buildings and practically all the cathedrals of Europe date from this century. This period also saw the development of a great national literature in every country in Europe. The Cid in Spain, the Arthur Legends in England, the Nibelungen and the Meistersingers and Minnesingers in Germany, the Romance of the Rose, and the Troubadours in France, and Dante in Italy, all of these came during the Thirteenth Century.

In the course of writing a book called "The Thirteenth, Greatest of Centuries,"[1] I have been brought close to all this development at this time, so that it was no surprise to find the beginning of ophthalmology also there. Before the end of the century Bernard Gordon, the Scotsman, teaching medicine at Montpellier, had recommended the use of spectacles for those whom advancing years deprived of clearness of vision. In general, indeed, the medical and surgical history of this period is most interesting. They had a method of anesthesia; the great Italian surgeon, William of Salicet, taught that it was necessary to try to get union by first intention, and nearly every other department of surgery was in the full swing of development. They were tying arteries, sewing up wounds of the intestine, doing radical operations for hernia, using the exaggerated Trendelenberg position by hanging the patient up by the feet in order to make operations for strangulated hernia less dangerous, and in general anticipating most of what we are prone to think as distinctly modern ideas in surgery.

To know all this adds to the curiosity with which one approaches the little volume on "Diseases of the Eye," written by the ophthalmologist, Pope John XXI, who was killed by the falling in of a building in May, 1277. This is probably not the only book that he wrote, for we have besides a "Thesaurus Pauberum Treasure of the Poor," a sort of medical handbook for poor people, which is also attributed to him. This seems not to be the work of his own hand, but to have been compiled under his direction. It does not contain directions for the use of drugs so much as other methods of treatment, and was apparently meant to keep people from being imposed upon by the charlatans of the time, for the medical charlatan has been always with us just as the poor themselves. During his years of teaching at the university this man, who was well known before being made Pope as Peter of Spain, had also written a little book on logic for the use of students. Medical students were supposed to spend several years at logic before beginning medicine in those days—perhaps to the benefit of the medical course. This little book on logic is praised by Dante, and Pope John is the only one of the Popes whom the great Italian poet has mentioned whom he has placed in Heaven—a fact that should be highly interesting to ophthalmologists of all times.

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[1] Catholic Summer School Press, New York, 1907.

The distinguished author of these several works, Peter, who was afterward to be known as Magister Petrus Hispanus, Master Peter the Spaniard and finally Pope John XXI, was born, according to the best attainable details, in the second decade of the Thirteenth Century. His father had been a physician and bore the name of Julius, and in spite of his son's designation the Spaniard was a Portuguese. Most of the writers who mention him declare that he came from an obscure family. He is one out of many of the self-made men of the Thirteenth Century who rose through intellectual advantages. He seems to have made his medical studies at Paris, though writers who are themselves interested in Montpellier claim that he was also there for a time, and it is not unlikely that the medical schools of both these universities, which were so celebrated at the time, attracted Peter, who had the Renaissance spirit already awakened in him of trying to exhaust all knowledge. While he was Pope he wrote a letter to the Bishop of Paris in which he congratulated himself in having been for many years "*per plurimos annos*"—in the University of Paris.

In this letter he confesses that he retains a special affection for Paris, because "within its dwellings he had been brought up from early years and applied himself to various sciences, finding the opportunities provided for education most savory. After the deep draughts of knowledge there obtained, as far as the God of Majesty, the giver of true wisdom, permitted him to take its opportunities, he does not think that he will be ever able to forget how much he owes to that 'Mother of Study.'" Some time during the sixth decade of the Thirteenth Century, when he was probably about 35 years of age, Peter received an invitation to the chair of physic, as medicine was then called, at the University of Siena in Italy. His salary was to be 40 lire a year, a sum which seems very small, but it is impossible to say what the value of money was at that time.

Just what sort of teaching in medicine Peter did in Siena we are not quite sure, though doubtless his little volume on eye diseases should be taken as an index of the practical nature of his instruction. It serves to show that clinical observation held a large place in his method. One other thing seems sure. During his time as professor of medicine at Siena this Italian town passed the first law that we know of, in modern history at least, for the regulation of public health. That this was due to Peter's influence we gather from the fact that later on when he was recalled to Rome he was made not only the physician to the Pope, but, moreover, the physician to the Papal City under the title of Archiater, an office that would about correspond to that of chief of the department of health in our time.

This, of course, would stamp him as a great benefactor of mankind in another way, since after all it is the development of sanitary science by means of public health regulations that has done so much to make the health of communities better and lower the death rates of our cities. It may seem surprising to find the beginning of this in the Thirteenth Century, but it will not be so to those who know how thoroughly the men of that time entered into every phase of human thought, and how much they accomplished for humanity in every department that has proved enduring.

Peter's book on eye diseases, however, rather than himself and his career, are our special interest here. It must have attracted widespread attention and been much read, for in spite of the vicissitudes of time there are still some half a dozen manuscript copies of it in existence. There are books often considered more important of which we have fewer manuscripts. Of course his treatment of the subject of eye diseases was not as formal and regular as our modern text-books of this subject, but if we go over it a little we are able to get the hints of how Peter would have treated the subject in our formal way had that been the custom of the time. It is quite possible to arrange the information he has under the divisions of anatomy, physiology, pathology and treatment.

The initial sentence of the book—according to the custom of the times—is the invocation which we still use in such formal documents as wills, and which is to be found very commonly in all hospital and medical college degrees, down even as late as Harvey's time: *"In nomine Dei Amen."*—In the name of God Amen. The text then opens logically with an account of the anatomy of the eye.

Peter had much more information of the anatomy of the eye than perhaps we would be apt to think that they possessed. He says that the eye is composed of seven tunics or layers and three humors. Of the three humors he calls what we now know as the aqueous, the albugineous. The other two refractive media bore in his time the names they do now — the crystalline and vitreous bodies. In his enumeration of the seven tunics or layers of the eyeball he begins with the retina, and apparently had at least some vague idea of the fundamental importance of this layer for vision. In this, however, it must be confessed that he simply follows the orders laid down by previous writers on ophthalmology, especially the Arabs, who as early as the Ninth Century named the coverings of the eye this way. What he calls the secundine tunic is the chorioid, and then he mentions the scliros (thus). The fourth tunic bears in his enumeration the name of the tela aranea (the spider-web), evidently in relation to the delicacy of this tissue, and this undoubtedly refers to the iris. The fifth tunic is the uvea, with the same name as at present, and then there are sixth and seventh, the cornea and the conjunctiva named as now.

He then speaks of the muscles of the eye, and asserts that each eye has eight. Six of them, however, he calls lacerti, that is, reins or guiding ribbons for the eye. The other two external muscles that he refers to are evidently the elevator of the eyelid and the orbicularis palpebrarum, the sphincter muscle of the lids, which he includes among the eye muscles. He knows that the eye is spherical, for he speaks of it as "a noble round, radiating member." This last word, 'radiating,' gives us a hint as to his notion of the physiology of vision. In it is contained the ground work of the old theory that there were visual radii or radiations which came out from the eye, this idea evidently depending on the radial manifestations which we see with regard to lights or bright objects. These radiations were, according to the philosophers of antiquity, supposed to originate in the eyes, to be reflected back from the objects and thus establish a contact, as it were, between the eye and the object, and therefore between the mind behind the eye and the objects outside of it. This curious physiology of vision was developed much more fully after Peter's time.

Vision from another standpoint for Peter is nothing else than the crystalline humor. This phrase of his summed up another old physiological theory of vision that the images of objects were formed on the lens. A more metaphysical definition given by him is that "to see is the paradise of the soul which goes out through the eyes as if through the bars of a prison" and this paradise of the soul, the function of vision, is an intermediary between objects and the rational faculty, and it is because of this going out of the soul that we are ready to distinguish colors and figures.

What Peter has to say with regard to the pathology of the eye is more interesting to the modern ophthalmologist than his curious physiologic theories. He had a reasonably good idea of most of the eye diseases, and many details of information that are rather surprising for a period so long ago. He attributed crossed eyes to an affection of the eye muscles, but said that this was due to a defect of the brain. There were apparently some cases, however, in which he thought that the muscles alone were the causes of squint, while in others it was the nervous system. Evidently he knew something about both strabismus and ophthalmoplegia.

Pterygium, which according to the habit of the time Peter called ungula or nail, from supposed resemblance to the shape of a finger nail, Peter mentions, but can only suggest applications of eel's blood for it. He mentions a form of blepharitis which he treats by the removal of the hairs, and the ashes of the leaves of the fig tree mixed with oil of bitter almonds. There is also an external application for this made of sweet oil, in which has been boiled small lizards. Lacrimal fistula Peter not only described, but he knew how difficult it was to treat, very probably from personal experience as well as the observations of others. He suggests the employment of exorcisms against it, on the principle that, as has been suggested by Zanbrini, anything that was so intractable as lacrimal fistula must be the work of the devil and could only be improved by some means that would drive him out. As noted by Dr. Petella in his article in *Janus,* it was not until the beginning of the Eighteenth Century that Anel at Turin gradually brought to perfection the radical treatment of lacrimal fistula.

It is with regard to certain internal eye diseases that Peter's knowledge is perhaps most surprising. He describes cataract and has much to say of it under the designation of water "which descends into the eye." He sketches the distinction between cataract which is produced from without, traumatic cataract, and that which arises spontaneously from internal causes. In Peter's time they treated cataract by dislocation of the lens by means of a needle made of gold or silver. He does not make any mention of this, however, and as the manuscript has come to us in somewhat defective shape, this is thought to be among lost pages, for Peter does mention the use of a needle for certain other things about the eyes, and especially describes an operation invented by himself for the treatment of trichiasis in which he cauterized the follicles of the cilia with a gold or silver needle. After this operation he bathed the eye with some "limarasicea water," a term which has quite confounded the commentators, for there is no possible hint of the composition of this external remedy.

Perhaps one of the most interesting suggestions in pathology that Peter makes is with regard to the hardening of the eye. He describes two forms of this in one of these, which he calls *petrositassor petroscezza* in the Italian manuscript and which he explains later on by the word *tenebrosite,* or a collection of humor in the pupil causing the eye to become hard as stone. By this term he evidently means to designate an intense edema. He describes a very different sort of hardness of the eyes under another name, *durete,* which he thinks a special disease coming from a natural melancholy that the ordinary expulsive power of Nature is unable to dispose of. Petella, who has studied Peter's manuscript very carefully, is inclined to think that by the second form of hardness, what we now call glaucoma is intended. For the hardening of the eye due to edema Peter recommended cathartic medicines, senna, aloes and various other purgatives. He also recommends a better nutrition of the patient with rest and diluting of whatever wine he takes. For what we would now call glaucoma he prescribes fumigations with a decoction of acanthus mollis. He recommends that all excesses in every way of eating or *in Baccho* or *in Venere* must be avoided.

In treatment Peter has many curious suggestions that the modern ophthalmologist would find hard to understand. Therapeutics in every department is the curiosity of medical history. We are prone to think that the medieval physicians were especially absurd in the remedies they employed for diseases of which they understood so little. It must not be forgotten, however, that it was left for a critic of our time to say that "modern physicians employed many remedies of which they knew nothing for diseases of which as a rule they knew less." Professor Richet, the distinguished director of the physiological laboratory, and professor of physiology at the University of Paris, in a recent article on "Medicine, Physician and Medical Schools" in the important French magazine *La Revue Des Deux Mondes,* said that physicians must confess that it is in therapeutics always that our so-called science of medicine is weakest. At any time in history physicians who look back fifty years would be sure that most of the remedies that their colleagues of a half-century or before had been giving were absurd. It seems not unlikely, he adds, that after fifty years many of the things that we are now doing for the treatment of disease will seem quite as absurd as those employed by our colleagues in the past.

Favorite lotions for the treatment of eye diseases suggested by John were solutions of sugar and of honey. This was a day when there were many ointments in all branches of surgery, so that it is not surprising that there are many different kinds of ointments for eye diseases. John's collyria nearly always had some bile in them, and also some white wine. The bile employed came from different animals according as varying strength of ointment was supposed to be needed. The bile of birds and especially of the thrush and crane was supposed to be strongest. The bile of the fox and the dog, of the cat and of the turtle-dove were also employed. This very general use of bile or some extract of the livers of animals or fishes for the treatment of eye diseases seems to go back to Biblical times when old Toby was cured by the gall of a fish, which after being rubbed in for half an hour "caused the whiteness of the eyes gradually to disappear just as if one would remove the membrane of an egg," as may be read in the book of Tobias.

A rather curious remedy, apparently suggested for many forms of conjunctival irritations and inflammation, was the urine of infants. This would seem extremely objectionable to us, and yet one can not help but think that empirically it may have proved soothing and that it may be justified on scientific grounds. After all, the urine of infants is usually a bland fluid not strongly acid and of such a specific gravity that it would not set up osmotic processes in the eye. It might, in the absence of a solution of boric acid, be as soothing an eye-wash as could be found. Infant urine very seldom contains bacteria, and rarely also contains any pathological materials. It is just a solution of salts, of a specific gravity approaching that of the blood. In the olden times the idea of using it would seem much less deterrent, because it was quite a common practice for physicians to taste urine in order to determine whether it was sweet or had certain other qualities from which they might suspect certain pathological conditions.

With regard to another suggestion of Peter's, however, we can have nothing to say. This, however, was only to be used on the eye after being filtered. It was a solution of human excrement in white wine.

As might be expected, Peter has some special remedies for styes. The remedies for this affection have been so many and so curious that one is not surprised to find a queer suggestion in this old-time ophthalmologist. It was the body of ants, the head being removed, ground up and placed on the eyelids. This was guaranteed to cure. On the other hand, some of the remedies have quite a familiar modern air — for instance, purgation was one of the things suggested where styes occurred frequently, and the substance recommended for this purpose seems to have been our cascara sagrada.

For various forms of conjunctivitis the white of egg was employed, and for hemorrhages into the conjunctiva a mixture of honey and the white of egg was especially recommended. As we have said, however, bile and preparations made from the livers of animals and fumigations with the smoke of burning liver were perhaps the most important remedies suggested in the ophthalmology of this kind. This might seem utterly absurd, and yet Dr. Petella, in discussing this subject, does not think so, and he refers to various recent authorities in ophthalmology who have reverted to some of these old practices in the use of fumigations with the livers of animals and whose experience show that probably the medieval ophthalmologist was not so ridiculous as we might think.

One of the most interesting features of Peter's book is the authors he quotes in confirmation of various ideas and from whom he borrows the details of pathology and treatment. He confesses his obligations especially to Theodore, who was probably a physician of the Emperor Frederick II during the first half of the Thirteenth Century. Theodore was Peter's special master and patron. Peter seems to have known the old authors pretty well, for he quotes Plato and Hippocrates' aphorisms with regard to the eye. Avicenna is quoted among the more modern writers, and Constantine Africanus, the celebrated teacher of medicine of Salerno, the greatest writer on medicine of the Eleventh Century, who retired to the monastery at Monte Cassino and became a monk in order to have the time and leisure to complete the dozen of folio volumes on medicine that are attributed to him. The medical authority to whom Peter most often refers is Galen, who was the most read medical author during all the Middle Ages, and who dominated medical thought for more than a thousand years. Of his contemporaries, two, Anselmo of Giovino and William of Salicet, the celebrated Italian surgeon of the time, who was the first to introduce case histories into his text-book on surgery, are probably the only ones to be mentioned. William was undoubtedly the greatest genius in surgery of his century. Prof. Clifford Allbutt, in his address on "Medicine and Surgery Down to the Sixteenth Century," at St. Louis in 1904, placed him on a lofty pinnacle when he declared that he had suggested the necessity for trying to obtain union by first intention.

Peter borrowed some remedies from the school of Salerno, and especially from Bienvenu Grasse or Graphée of Jerusalem, whose book, the *Ars Probata de Ægritudinibus Oculorum,* was one of the best known treatises on eye diseases in the Twelfth Century. Curiously enough, Bienvenu and Peter of Spain are quoted in certain passages together by Guy de Chauliac in his Chirurgia Magna. Guy was the father of modern surgery, and there was little that was of any value in the writers preceding his time that he did not collect into his book. Unfortunately, however, he rejected William of Salicet's idea of union by first intention, and it is to him that we owe the teaching of the necessity for pus formation in most cases if union is to be secured. In a word, Peter's little book, its citations from predecessors and its quotation by workers in medicine who came after its author, is a central point from which the history of some four or five medical centuries may be viewed to advantage.

The surprise of the book and the incidents connected with it is, of course, that the leading ophthalmologist of an important century in medical history should have been chosen as Pope. The ordinarily accepted ideas as to the relations of the Popes to science would not lead us to expect anything like this. All the distinguished physicians and surgeons of the centuries from the Tenth to the Fifteenth, except, of course, the Arabs, were clergymen. The men whom we have mentioned here in connection with Peter's book, Constantine Africanus, William of Salicet, Lanfranc the great leader of surgery and anatomy in Paris, and Guy De Chauliac the father of modern surgery, were all ecclesiastics who had taken at least minor orders, and some of the physicians and surgeons like Peter himself reached high ecclesiastical preferment. The papal physicians, that is the official medical attendants of the Popes, in these centuries, so far as we know them, are among the greatest contributors to medical science and include many of the names best known in medical history. The medical school at Bologna was in the Papal States for several centuries at the height of its fame, and probably the greatest investigating medical school, the one in which, to use a very modern phrase, intensive research was the watchword of the faculty, was the Papal Medical School at Rome, in which such men as Columbus, the discoverer of the circulation of the blood in the lungs; Eustachius of tubal fame; Varolius, after whom the Pons is named; Caesalpinus, to whom the Italians attribute the discovery of the circulation of the blood before Harvey; Malpighi, whose name is attached to more structures in the human body than any other; were the great teachers.

The more we know in definite details about these early times the less does the complacent impression remain that ours are the only generations who have ever done serious work in medicine or in science. In gathering material for a book on The Popes and Science, recently published by the Fordham University Press,[2] what I had particularly called to my attention was the immense amount of knowledge which had been gained in the past and then lost through some neglect or through some turning of attention to other subjects. Certainly the universities of the Thirteenth Centuries and, above all, the medical schools which required three years of preliminary study and four years of medicine before a degree was given, and a fifth year if surgery was to be practiced, deserve anything but contempt, and make us realize that instead of advance we have only too often retrograded.

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2. Fordham University Press, New York, 1908.

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Erratum.— In Dr. Myles Standish's article on "The Artificial Illumination of School Rooms," Vol. V., No. 1, p. 8, the diagram Figure 3 has been misnamed "Tungsten Lamp." This should be correctly named "Gas Fixture."

## *Abstracts from Recent Ophthalmic Literature.*

### AMBLYOPIA AND BLINDNESS.

On Blueblindness Caused by the Yellow Color of the Lens.—Hess, C., Würzburg (*Archiv fuer Augenheilkunde*, lix, 1, 1908, p. 29), proved by his observations on a case, which is reported in detail, the so far not generally known fact that the yellow color of the human lens, without disturbing impairment of its transparency, may attain sufficiently high degrees to produce, by absorption, complete blueblindness. A woman, aged 69, who had V. with —20.00 6/xl and read finest print (Nieden No. 1) fluently at from 5 to 6 cm., could not well discern blue colors. In mydriasis the lens, examined by daylight, yielded a very dark brownish yellow reflex, while with the ophthalmoscope the pupillary area appeared uniformly red, and showed no radial opacities of the lens. The fundus could be easily seen, and appeared normal, excepting a narrow conus. Very intense light had no glaring effect.

In testing her color sense, Hess found that she called the colors as they appeared to him through yellow glasses. A blue pigmented paper appeared to the patient almost greyish black. Tested with the spectrum, she saw only the red, yellow, and barely the green squares, while the greenish blue, blue and violet squares, very plainly visible to a normal eye, were not perceived. Hess compares this shortening of the spectrum in its short-waved portions with his observations on chickens and pigeons, in which this is due to absorption of the short-waved light by the yellow and red oil globules of the cones. The terminal light has a similar composition in both cases; its lack of short-waved rays in both is produced by absorption through a yellowish red and yellow filter, which in daybirds consists in portions of the retina, in the patient in the lens.

Hess says it is generally true that the coloration of the lens increases with advancing age, but not equally, as lenses of relatively youthful eyes are not rarely more yellow than those of older persons. Hering proved that the lens of the newborn is yellow. For illustration, nine lenses of persons between the ages of from 7 to 70 of different shades of yellow are depicted.

C. Z.

ACQUIRED VIOLET BLINDNESS FROM CLINICAL AND PHYSIOLOGICAL STANDPOINTS.—KOELLNER, H. (From the eye clinic of Prof. J. von Michel in the University of Berlin. *Zeitschrift fuer Augenheilkunde*, xix, 1908, *Ergaenzungsheft*, p. 1.) Violet blindness, according to the various color theories also called erythrochloropia, akyanopsia, yellow-blue blindness, is present if the patient practically sees only red and green, or experimentally if a person with normal eyes looks through a yellow glass. So far it has been observed in detachment of the retina, albuminuric, diabetic and specific retinitis, etc., glaucoma, retinitis pigmentosa, but never in a pure affection of the optic nerve, e. g., tabetic atrophy. It thus indicates an involvement of the retina in the morbid process and is perhaps caused by absorption of rays by the sub-retinal fluid, but does not allow of a differential diagnostic distinction between the single forms of diseases of the retina. Koellner found violet blindness in 90 per cent. of his cases of detachment of the retina which he examined systematically for it. The visual field in violet blindness is characterized by its occurrence in foci.

The results of the physiological tests with spectral colors, equations of mixture of colors, colored pigments, selections of skeins, with pseudo-chromatic, Stilling's and Nagel's plates, Nagel's equation apparatus, absorption of colored lights by pathological processes and its relation to violet blindness, subjective phenomena, course and termination of violet blindness and finally the clinical diagnosis and differential diagnosis of violet blindness are discussed in detail, which must be read in the original.

We can only mention the directions of the author for violet blind scotomas by perimetry: 1. With white object, a greenish or bluish discoloration occurs in violet blindness. 2. With pure blue, indigo colored object, discoloration into green or blue green. 3. With green (not too yellowish green) object, remains unaltered or bluish. 4. With yellow object, pink or white, more rarely lavender. 5. With red object, it becomes darker, more vivid or remains unaltered.

Congenital violet blindness is so rare that it is diagnostically irrelevant. The literature is carefully utilized. C. Z.

CONCERNING THE LOCAL DIFFERENCES OF THE FUSION FREQUENCY UPON THE RETINA AND ITS VARYING BEHAVIOR IN CONGENITAL AMBLYOPIA.—LOHMANN. Muenchen (*Graefe's Arch.,* lxviii, H. 4, July 14, 1908) undertook the investigation because he believed the results would bear upon the question of the cause of congenital amblyopia.

He employed a disc 20 cm. in diameter, one-half of which was covered with white, the other half with black paper. The observer was removed 1 M. The disc was attached to an electric motor and the number of revolutions was registered. The eye tired quickly by intermittent stimulation and more quickly in the periphery than in the center. For a rested eye the disc was still scintillating when the rapidity of rotation was sufficient to produce a continuous impression if the speed was increased from a slow to a rapid degree.

To determine the true threshold for a retinal point 15° peripherally from the fovea the gaze was directed 15° from fixation and the speed of rotation of the disc increased. To obtain the threshold at 30° from the fovea a further change of 15° in fixation was made. While it was found that the disc must rotate at a rate of 39.37 to produce a continuous impression at the macula it rose to 50 at 15° peripherally to the temporal side and to 66.67 at 45°; 15° peripherally to the nasal side 46.16, and to 66.67 at 45°. Vertically above the macula 15°=54.54 and at 45°=66.67. Vertically below the macula 15°=50 and at 45°—. No matter what this preponderance of the peripheral parts of the retina for adaptation for darkness, it is important to know how an amblyopic eye conforms to this. As to the anatomical origin of this condition opinions differ, and, influenced by the teachings of Worth, many look upon it as an amblyopia exanopsia. Should the figures of a congenitally amblyopic eye and those of an acquired amblyopic eye agree, it would point to the unity of these conditions. A lower fusion frequency would suggest an anatomic basis for the amblyopia. Braunstein has shown that for all fundus diseases the fusion frequency is lessened, and consequently an increase in the number in congenital amblyopia would corroborate the author's belief in a disturbance in the isolation of the retinal elements in the retinal centre. The investigator tested a patient with congenital amblyopia and obtained an average of 55 for central fusion frequency, against 40 as normal. This demonstration is not only interesting theoretically, but appears to the investigator to have practical bearing, as it may afford a means of differential diagnosis in those occasional cases where it is difficult to differentiate between congenital amblyopia and acquired amblyopia. W. Z.

## ANOMALIES.

Report of a Case Showing Manifest Canal of Cloquet.—Maisch, A. C., Hagerstown, Md. (*Ann. Ophthal.*, July, 1908.) A child of six with convergent squint of six months' standing O.D.V.=6/lx, O.S.V.=6/xl. The left eye under atropin showed an adhesion of iris to the lens below. Extending from the surface of the disc forward, downward and a little to the temporal side of the median line through the vitreous, there was a manifest canal of Cloquet, about 3/4 D.d. broad, and tapering very slightly as it left the disc, maintaining a cylindrical shape throughout its course in the vitreous, translucent in appearance, being about the same color as the disc, and having several small blood vessels on its surface. The inferior retinal vessels curve around its base, slightly anterior to the disc, and are lost to view for about 1/2 D.d., where they are seen coming from beneath the canal, on the retina. The hyaloid canal can be followed through the vitreous into the anterior part where it is lost to view behind the iris. M. B.

A Case of Incomplete Congenital Ophthalmoplegia Externa.—Stephenson, Sydney, London (*Ophthalmoscope*, September, 1908). A Jewish boy of 8 years gave a history of never having been able to open his eyes, and that the condition became worse toward nightfall. No family history of similar defect. The child was born at term, was delivered with instruments, the scalp being wounded during the operation. The action of the iris is normal and accommodation is normal. The eyes have a movement of 2 mm. in all directions and more than this downward. Slight coloboma of both optic discs. The 2d, 3d, 4th and 6th cranial nerves alone were involved. The author discusses the question of causation at considerable length, and concludes with the statement that he is inclined to attribute most cases of congenital ophthalmoplegia to an affection of the nuclear centres which govern the defective movements. M. B.

Multiple Indentations of the Rim of the Cup of the Secondary Ocular Vesicle; a Contribution to the Question on Coloboma.—Wolfram, C. (From the eye clinic of Prof. H. Sattler in the University of Leipzig. *Klinische Monatsblaetter fuer Augenheilkunde*, xlvi, 11, 1908, p. 27), found at a very early stage multiple indentations at the anterior margin of the secondary ocular vesicle in embryos of rabbits, pigs and man, and considers them, at least in the rabbit and pig, of frequent occurrence. Probably they are caused by the blood vessels coursing over the rim of the cup into the interior to the bulbus hyaloideus, which do not grow at the same rate as the epithelial mass of the ocular cup, and thus produce these notches.

Another explanation is given in the unequal growth of the wall of the cup, so that some places of its rim advance more than others, thus producing indentations. The vessels will take the shortest way to the interior, which lies on the indentations.

In later stages these indentations disappear. Then Wolfram found at the time when the margins of the ocular vesicle were closing, blood vessels running through the fissure, where the margins remained still apart. He considers the part which the mesoderm plays in the closure of the fetal ocular fissure of great importance and believes that his findings will, in future investigations on a larger scale, greatly promote the understanding of the development of coloboma at the typical place. A. von Szily made the same observations of multiple indentations. C. Z.

## BACTERIOLOGY.

SOME STAPHYLOCOCCAL INFECTIONS OF THE EYES AND THEIR TREATMENT WITH VACCINE.—MAYOU, STEPHEN, London (*Ophthalmoscope,* August, 1908). Fourteen cases are reported; eight were extraocular, and were mostly associated with acne rosacea, styes or boils. The ocular affections were corneal ulcers, phlyctenulæ, conjunctivitis and blepharitis. The intraocular affections were metastatic and post-operative infections. The vaccine used was the mixed staphylococcal vaccine prepared by the Jenner Institute of Preventive Medicine, or a vaccine prepared from the patient's local lesion, after the method of Wright. The opsonic index was watched in most of the cases, but is not deemed absolutely essential. The first dose should not exceed 500 million staphylococci, but may be increased to 2,000 million. In the multiple lesions of the face and eyes, the ocular lesions got well much faster than the face lesions; although the face lesions improved in all cases, some did not get well completely or were only slightly improved. Of the intraocular affections, two cases of metastatic panophthalmitis are reported in which enucleation was performed in both of which the staphylococcus albus was found in smear preparations of the pus from the eye and in pure culture on the media. These two eyes are not reported to show results of vaccine treatment, but for their etiological importance. Three cases of metastatic iridocyclitis are reported, in one of which some aqueous was collected, and from this a pure culture was obtained of staphylococcus albus. Complete and rapid recovery took place in these three cases upon vaccine treatment. He speaks of three cases of suppuration following needlings in which the staphylococcus albus was found in pure culture in all of them.

M. B.

THE CULTIVATION OF THE MENINGOCOCCUS FROM EYE CONDITIONS COMPLICATING EPIDEMIC CEREBROSPINAL MENINGITIS.—McKEE, HANFORD, Montreal (*Ophthalmic Record*, September, 1908). During the last year, at the Montreal General Hospital, seven cases of epidemic cerebrospinal meningitis have been seen in which ocular complications were present. One was a case of metastatic ophthalmia and six were cases of conjunctivitis. From the pus in the anterior chamber of the hypopion iritis case and from the conjunctiva in two cases of conjunctivitis were cultivated Gram negative diplococci, which were carefully studied and shown to be meningococci. To these cases is to be added the cultivation of the meningococcus once from the normal conjunctival sac. The author lays great stress upon the inaccuracy of basing a diagnosis of the meningococcus from the presence in smear preparations of Gram negative diplococci. Meningococci can only be positively demonstrated by carefully studying it in cultures on various media.

M. B.

PALPEBRAL SPOROTRICHOSIS.—MORAX and CARLOTTI (*Annales d'Oculistique*, June, 1908). This name is given to a special infection produced by the proliferation in the tissues of the sporotrix, which has caused subcutaneous, cutaneous, mucous and visceral foci.

Palpebral localization has been recorded by Danlos and Blanc, and a case is reported by the authors. There were swelling of the upper eyelid, ulcerations of the free border with little dermic abscesses, lymphangitis and adenopathy; all ovulating chronically. The patient was subject to attacks of acne of the face, but there were no other special antecedents. There were no symptoms of syphilis, and tuberculosis was excluded by bacteriological examination.

A full report of the microscopical findings, with illustrations, and of the bacteriological examination is given. The disease yielded to the administration of iodid of potassium without local treatment.

G. C. H.

RECENT ADVANCEMENTS IN EYE, EAR, NOSE AND THROAT WORK THROUGH BACTERIOTHERAPY.—BERGHAUSEN, OSCAR, Cincinnati

(*The Ohio State Medical Journal,* October 15, 1908), says: "Numerous cases are on record in which tubercular keratitis, iritis, chorioiditis and retinitis, either of the local nodular type or of the diffuse order, have been healed." Three cases of different observers are recorded. He says that "in these cases there is to be noticed at first a diminution in the local inflammatory condition, irritability disappears, the iris responds more readily to atropin, the exudate in the anterior chamber gradually disappears and the visual acuity returns." M. D. S.

## CATARACT.

TREATMENT OF IMMATURE CATARACT.—SMITH, H. MAJOR, Jallundur (*Lancet,* August 15, 1908), notes that a great drawback of the capsulotomy operation for extraction is the impossibility of removing all the soft cortex of an immature cataract. The result is iritis, and a dense after cataract requiring extraction. Needling is insufficient, and couching is invariably followed by degeneration of the retina. Slowly ripening cataract subjects the patient to a long period of inactivity and loss of earning power. Of the various methods advised for maturation, puncture of the lens capsule is liable to be a complete failure. Rapid swelling may cause acute glaucoma. Lens masses may escape into the anterior chamber and set up iridocyclitis. Extraction under these conditions may be imperative, but it is hurried, the conditions are unfavorable and the results far from satisfactory. Iridectomy has no influence on ripening. Combined with massage through the cornea, within safe limits, i. e., not sufficient to risk dislocation of the lens, it is also unreliable. The combination with direct massage is "a daring and a most unsafe procedure." Rupture of the capsule or dislocation of the lens may follow manipulations by even the most careful and expert operator. The ripening procedures are all either dangerous or disappointing, and we had better wait for the cataract to become mature or extract the immature cataract in the capsule, "a procedure for which it is admirably suited." In fact, even the normal lens can be extracted as easily as the ripe one by those skilled in the art, as in case of dense leukoma of the cornea with adherent iris. The operation of extraction in the capsule should be performed as soon as vision is so far reduced as to incapacitate the patient for his usual occupation. Major Smith then gives in detail the technique of expression of the lens by means of squint hook and spatula as practiced by him in about 17,000 extractions and reported in full elsewhere. P. H. F.

Statistics and Practice of Cataract Operations.—Geisler, Solingen, and Wick, Berlin. (From the eye clinic of Prof. Dr. Schoeler, Berlin. *Archiv fuer Augenheilkunde,* lxl, 2 and 3, 1908, p. 198.) From 1896 to 1907, 5,057 eye operations were performed, of which 1,322 were for cataract, viz., 798 senile, 19 diabetic, 93 traumatic, 48 complicated, 42 soft congenital, 123 zonular, 199 secondary. Flap extraction upwards, mostly with iridectomy, 75 without. Simple extraction was considered indicated in relatively young persons, of whom quiet behavior after the operation may be expected, to give them the greatest possible amount of vision. Sublimate was used as antiseptic, and cocain, 5 per cent., as anesthetic in all cases of senile cataract. Prolapse of vitreous occurred in 38. In such cases the speculum was removed after expulsion of the lens without maneuvers for reposition, the palpebral fissure dusted with xeroform, which with the tears gives a very firm closure of the eye, and the single turn of the bandage sewed together. Weber's loop was used in 12 cases, in 4 of these the dislocated lens was extracted within the capsule. If possible, the patient remained in bed for 3 days. The other eye was not bandaged after the second day; the eye operated on after two weeks. Discissions for secondary cataract were made in 88 cases, i. e., in a proportion of 1 to 9, not earlier than three weeks after extraction, and always vertically to the lines of greatest tension, which must be carefully ascertained with the magnifying glass. There were 16 (2 per cent.) failures, 13 from purulent infection with panophthalmitis, 3 from iridocyclitis with subsequent phthisis. Seven patients died suddenly after the operation while still at the clinic. Preparatory iridectomy was performed in 29 cases, viz., 4 for artificial ripening, 7 for seclusion and occlusion of the pupil, 6 in anophthalmus of the other eye, 8 for glaucoma, 2 in purulent affections of the tear duct, 1 in diabetic retinitis, 1 in granulosis. The operation in 19 cases of diabetes was the same as usual, in 3 of them only fingers could be counted on account of diabetic retinitis.

In 13 out of 93 cases of traumatic cataract perfect vision was obtained; in 6 exenteration was performed, which is preferred to enucleation in infected injuries and panophthalmitis.

One hundred and twenty-three cases of zonular cataract were operated upon, 50 bilateral, in one sitting. Only in 8 cases discissions, respectively extractions, were performed. In most cases optic iridectomy is preferred, i. e., if by atropin vision is improved, as the preservation of accommodation is of paramount value to the patient, while the changing of near and distance glasses or bifocals is inconvenient. In almost all cases in which extraction had been performed on one eye, iridectomy on the other, the patients preferred the vision of the latter, even if the vision of the aphakic was equal or better. The authors consider this as proof that iridectomy is the better method, and say that it cannot be recommended often enough to the blessing and contentedness of the patients. If, however, the opacities of the lens reach to the periphery and atropin does not improve the sight, discission or extraction is indicated. C. Z.

REPORT ON THE LAST 500 EXTRACTIONS OF SENILE CATARACT, WITH SPECIAL CONSIDERATION OF COMPLICATED CASES.—HAESSIG, Beda. (From the eye clinic of Prof. C. Mellinger in the University of Basel. *Zeitschrift fuer Augenheilkunde,* xlx, *Ergaenzungsheft,* 1908, p. 71.) Especial attention is paid to the preparation of the patient for the operation as to conjunctiva, lacrimal apparatus, skin, suppurations on other parts of the body, urine, exercises in turning the eyes downward, preliminary borated dressing, which as illustrated by a case, renders latent inflammations more readily manifest. The knives are placed into concentrated alcohol, the other instruments into a 3 per cent. solution of carbolic acid for 20 minutes, and then into a solution of boric acid, the gauze sponges into sublimate 2:5000. The conjunctival sac is irrigated with sublimate 1:5000, then 6 to 8 drops of a 2 per cent. solution of cocain are instilled. After the contrapuncture the fixation forceps is removed. Massage with the lower lid for the removal of cortical matter is usually avoided. A well-fitting bandage is applied, which is removed every 24 hours, atropin instilled, on the eighth day the bandage is left off.

Prolapse of iris occurred in 32 cases, viz., in 7 without iridectomy, in 3 with iridectomy, in 22 with preliminary iridectomy. Twenty-eight extractions were simple, 158 combined with iridectomy, 314 with preparatory iridectomy. Preparatory iridectomy, six weeks previously, is the favored method, as it renders the whole course of extraction shorter and smoother. Panophthalmitis occurred in none of the cases, uveitis in 6.

Chorioidal hemorrhages were observed in 2 cases. It was not encountered on the second eye of a patient who had lost his first eye by it in another clinic, by avoiding injury of vascular parts of the eye. As cataracta nigra is considered to be predisposing to dangerous hemorrhages, Prof. Mellinger advises in such cases simple extraction and to perform the section as much as possible in the avascular cornea.

Atrophy of the optic nerve, following extraction in one case, was attributed to the observation of older authors that eyes of decrepit individuals sometimes do not bear operations well and react with degenerative symptoms. In 2 cases psychoses were observed after extraction, although the rooms of the patients operated on for cataract are not generally completely darkened.

C. Z.

CONTRIBUTION TO CATARACT OPERATIONS IN DIABETES.—KITAMURA, Japan (From the eye clinic of Prof. W. Uhthoff in the University of Breslau. *Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 1, 1908, p. 577), reports on 112 cases of diabetic cataract, operated upon in the clinic of Prof. Uhthoff, within the last ten years. In 90 cases flap extraction with iridectomy, in 14 flap extraction without iridectomy, in 8 (under 36 years of age), simple linear extraction were performed. Six cases were complicated by iritis, 3 times with hypopion. Four of these were caused by primary infection. Other complications were: Glaucoma in 1 case, secondary to hemorrhages of the retina, detachment of the chorioid in 1, postoperative hemorrhages into the anterior chamber in 9, tardy restoration of the anterior chamber in both eyes of the same patient (after two weeks), hemorrhages in retina and vitreous, the dependence of which from the operation must be left undecided, typical diabetic retinitis in 3 cases, bilateral albuminuric retinitis as incidental complication in one case.

Good vision (1 to 1/3) was obtained in 68.4 per cent., useful vision (1/4 to 1/10) in 12.6 per cent. On the whole, the operative results were not worse than in ordinary cataract. In none of the 112 cases a total failure occurred through the operation. Iritis was decidedly more frequent than after common extraction, about 4:1. Hemorrhages of the retina and vitreous, due to diabetes, were relatively frequent. They influence the optic result and must be considered in the prognosis. The usual methods of operation answer all requirements in diabetic cataract. The relatively more frequent occurrence of iritis demands particular exactness in antisepsis and asepsis. C. Z.

AN EXCEPTIONAL CASE OF COUCHING OF CATARACT WITH PRELIMINARY IRIDECTOMY.—TRUC (*Annales d'Oculistique,* May, 1908). In a case complicated with granular ophthalmia, entropion, trichiasis, purulent dacryocytitis and serious intraocular lesions, ordinary extraction was considered impracticable. After treatment of the granulations and the dacryocystitis, operation upon the entropion and preliminary iridectomy, the lens was depressed in the usual way, except that the point of entrance of the needle was sterilized by the actual cautery. Three weeks afterwards there was a vision of one-tenth.

The author maintains that, as a last resort in complicated cases, couching may sometimes be justifiable and useful. G. C. H.

THEORIES REGARDING THE FORMATION OF SENILE CATARACT.—POSEK, RIGOBERT, DR. (*Wiener Klinische Wochenschrift,* Aug. 20, 1908). One of the oldest and best accepted theories is that of Becker, who ascribes the formation of a cataract to senile sclerosis of the lens. After enumerating the theories of numerous other writers, Dr. Posek considers Romer's theory as the most probable one, according to which, the formation of a cataract is due to a diseased condition of certain blood glands, by which the eliminative power of certain autotoxic material is disturbed, and certain lens toxins remain in the blood.

Changes in the normal circulation of the blood vessels, in the ciliary bodies as well as degenerative processes in the ciliary epithelium, disturb the power of retention of the secretory apparatus of the eye, and make possible the transgression of poisonous matters in the nourishing fluid of the lens. The epithelium of the capsule of the lens becomes affected, and this leads to the further destruction of lens tissue.

It is as yet impossible to determine whether these autotoxic substances belong to the group of cytotoxins or are of some chemical nature such as uric acid. J. G.

COLLAPSE OF THE SCLEROTIC DURING THE OPERATION OF CATARACT EXTRACTION. — SIRIEYS (*La Clinique Ophtalmologique,* Feb. 10, 1908). Collapse of the sclera without loss of vitreous during the operation of cataract extraction is an accident not mentioned in the majority of recent works or in the encyclopedia. Terrien, in his "Surgery of the Eye," gives a short note of two cases. Le Roux, in a recent number of *La Clinique,* gives the report of a case; and Sirieys details two cases in his paper, in both of which, just after completing the incision, the sclera was found to be collapsed, so that it was impossible to extract the lens by the ordinary pressure maneuver. In both cases the loop was passed behind the cataract and delivered. There was in neither case any loss of vitreous, and both patients made a good recovery with useful vision. B. E. F.

## CASUISTICS.

Examination of One Hundred Eye Cases in the Dedham Public Schools.—Place, R. W., Boston (*Boston Med. and Surg. Jour.*, Aug. 13, 1908), found that many of the pupils had had no examination by an oculist, in spite of notification of the parents, and evident eye trouble, such as marked squint or impaired vision. The eyes were tested in a darkened room in the school building, the measurements for the frames taken at the time of determining the refraction, and the glasses delivered by the head master. Free glasses were supplied in some cases through the generosity of Dedham citizens. Of 113 children examined only 21 were wearing properly fitted glasses, 16 were wearing improper glasses, 29 did not require glasses, and 47 had glasses ordered. P. H. F.

Examination of Eyes in the Public Schools of Brussels.—de Ridder (*Annales d'Oculistique*, July, 1908), found in 2,827 children 42.8 per cent. with errors of refraction, including 21.5 per cent. with hypermetropia, 10 per cent. with myopia and 9 per cent. with astigmatism. He found that myopia increased with the age of the subjects, as follows: From six to eight years, 5.5 per cent.; from nine to ten years, 8.5 per cent.; from eleven to twelve years, 10 per cent., and from thirteen to fourteen years, 18 per cent. G. C. H.

## CIRCULATION.

The Cerebral and Ocular Complications of Anemia and the Probable Relationship of These to Thrombosis.—Hawthorne, C. O., M.D., Glasgow (*The Lancet*, Sept. 19, 1908). The writer interprets the ocular complications of anemia as due to the intravascular formation of blood clot, liability to this being increased by the admitted undue tendency to blood coagulation within blood vessels in the anemic state. He speaks of severe or fatal cerebral attacks occurring in anemic women, presenting among other symptoms double optic neuritis, due to thrombosis in the venous channels of the skull; hence such thrombosis is an efficient cause of this opthalmoscopic picture. Another consequence may be paralysis of one or the other of the ocular muscles, and he claims that there are many cases in which this association has been clearly established. Double optic neuritis and ocular paralysis may be the only symptoms of intracranial thrombosis.

"There are well-authenticated cases of anemia in which the patients have been attacked more or less suddenly by severe headache, pains in the neck and vomiting, together with optic neuritis and ocular paralysis. It is common to suggest that the intracranial condition responsible for these symptoms is a localized and transient meningitis, or an edema of the brain, though positive evidence in support of either of these views is difficult to find. On the other hand, thrombosis will cover all the facts, and, if allowed, will permit the construction of a graded series of cases, occurring in anemic patients, characterized by more or less severe evidences of cerebral disturbance, and finding in intracranial blood-clotting a common bond of interpretation. At one extreme are fatal cases with such symptoms as coma, delirium, various paralyses, and, sometimes, optic neuritis, and proved by necropsy to be dependent on intracranial thrombosis; next come examples of less severe but still considerable cerebral disturbances, including optic neuritis, and, having a favorable termination, the diagnosis of intracranial thrombosis being confirmed by the occurrence of thrombosis in the jugular, femoral, or other veins; succeeding these may be placed cases of unusually violent headache and vomiting, with optic neuritis and an ocular paralysis; and after these fall those cases of anemia in which optic neuritis and an ocular paralysis are the sole unusual events."

The writer says, furthermore, that it is at least suggestive that optic neuritis sometimes occurs in circumstances in which intracranial thrombosis is certainly a possibility, and where an explanation of the neuritis other than thrombosis is not easily imagined. Thus the occasional occurrence of optic neuritis in the acute anemia following free hemorrhages from mucous surfaces may be quoted in support of the doctrine that the optic neuritis sometimes seen in chlorosis is dependent on intracranial thrombosis.

He believes, also, that optic neuritis, and sometimes ocular paralysis, occurring as a complication of middle ear disease are due to intracranial thrombosis and not to meningitis: on more than one occasion, removal of a clot from the lateral sinus has been followed by disappearance of these symptoms.

In summing up the objections to this assumption of relationship, he says: "Neither a difficulty in providing a manifest explanation of the mechanism by which sinus thrombosis may produce optic neuritis, nor the claim that the frequent absence of general cerebral disturbance with such neuritis opposes the diagnosis of intracranial thrombosis, nor the observation that in arterial thrombosis optic neuritis does not occur, nor the comment that the neuritis disappears under treatment by iron, is found, on examination, to present any insuperable objection to the proposition that optic neuritis occurring in anemia has, in all probability, its explanation in the formation of blood clot in the veins or sinuses of the brain."

He cites examples of certain disturbances of the visual fields which may exceptionally appear as complications of this abnormality, and, lastly, mentions retrobulbar neuritis as an occasional complication of anemia, possibly due to thrombosis.

C. H. M.

THE CAUSES AND SYMPTOMS OF THROMBOSIS OF THE CAVERNOUS SINUS.—THOMSON, ST. CLAIR, London (*The Ophthalmic Review*, October, 1908). The writer found, upon perusal of the literature of this subject, that the source of infection is frequently attributed to some lesion of the nose or upper lip, to a carious tooth, or a phlegmon of the face and neck, when the much more probable focus in the accessory cavities of the nose has not even been suggested. He believes that the most common course is disease of the sphenoidal sinus and next pyogenic infection from the ear.

The possibility of thrombosis of the cavernous sinus is first suggested by the condition of the eyes, the three chief ophthalmic changes being papillary edema, chemosis and exophthalmos, developing from six to sixteen days from the onset of symptoms; this proptosis and chemosis may be present in both sides when it is first noticed, but it generally starts on one side and develops in the other one to six days later. There may be anesthesia, or ulceration of the conjunctiva, or opacity of the cornea; paralysis of the ocular muscles generally occurs. The condition of the pupils varies; they may be normal, unequal, small and not reaching to light, dilated, dilated and not reacting, or in medium dilatation with only slight oscillation. The fundus may be normal in rapid cases or at the commencement; later there may be congestion of the retinal veins, papillary stasis, edema, or atrophy, or optic neuritis. Vision may be preserved or there may be blindness. Tenderness of the eyeball may be met with. The variability in symptoms doubtless depends on the degree and extension of the thrombosis, whether it extends forwards from the sinus or originates in the ophthalmic vein and then spreads backwards.

C. H. M.

## CONJUNCTIVA.

PROPHYLAXIS AND TREATMENT OF BLENNORRHEA NEONATORUM.—GREEF, B. DR. (*Allgemeine Wiener Medizinische*

*Zeitung,* March 24, 1908.) Blennorrhea neonatorum is in every case an absolutely curable disease. Notwithstanding this fact 20 per cent. of all cases of blindness are caused by this disease.

It is important from a prophylactic standpoint to instruct the parents of the nature of this condition and to employ the instillation of a drop of silver nitrate into the eyes immediately after birth. Concentrated solutions from 2 to 5 per cent. are too strong; a solution of 1/4 per cent. is sufficient for the purpose.

If there is infection of the eye the local treatment consists in the irrigation of the conjunctiva with a 0.1 per cent. solution of silver nitrate. This mode of treatment is used by the mother or nurse for the first few days every hour or two. The method employed previously, that of touching the conjunctiva with a pledget of cotton, is dangerous on account of the possible injuring or infecting of the cornea. J. G.

THE ETIOLOGY AND TREATMENT OF CHRONIC CONJUNCTIVITIS. —ELSCHNIG, PROF. (*Wiener Klinische Wochenschrift,* Aug. 13, 1908.) The author describes two forms of chronic conjunctivitis, the first being conjunctivitis Meibomian, which is produced by the hypersecretion of the Meibomian glands.

In the slight form of this variety, the transitory fold and bulbar conjunctiva do not become affected, and only the palpebral conjunctiva is diseased; the upper and lower lids become thickened, the lid margins red, the palpebral conjunctiva thick and velvety, and diffusely reddened. There are often to be seen through the thickened conjunctiva, Meibomian glands filled with yellow secretion; an intense amount of thin pus can be emptied by employing pressure. Sometimes diplobacilli are found in this secretion.

This variety of chronic conjunctivitis can be cured by a thorough evacuation of the Meibomian glands, by expressing them every day or every week, according to intensity of the affection, and the use of astringents.

This condition of the conjunctiva is mostly to be found in persons above 40 years of age.

The second variety of chronic conjunctivitis, which is not so well known, is produced either by an absolute or relative insufficiency of the lids. In slight closure of the lids the margins of the lids do not approximate completely; this is readily observed when the patient is asleep. In these cases the bulbar conjunctiva near the lower corneal margin is dry, thickened, scaly and sometimes sclerotic. These eyes must be protected overnight with a bandage; a 2 to 4 per cent. borolanolin ointment is to be applied every night to the lower conjunctival sac. J. G.

AN EPIDEMIC OF PNEUMOCOCCUS CONJUNCTIVITIS. REMARKS ON ACUTE CONJUNCTIVITIS.—ALT, ADOLF, St. Louis, Mo. (*Amer. Journ. Ophthalmology,* September, 1908.) The writer describes an epidemic of pneumococcus infection and especially pneumococcus conjunctivitis which occurred during the spring and summer of this year in St. Louis and its vicinity. He found the pneumococcus not only in cases of acute conjunctivitis, but also in old chronic cases of conjunctivitis, trachoma and follicular conjunctivitis, and often there was no other germ.

Regarding the cases of pneumococcus conjunctivitis, the infection always concerned both eyes; in most cases there were no complications, the clinical picture and the symptoms varied greatly, and the duration was between five days and several weeks. There were very few cases which could be called typical; there was a variety of clinical pictures; not only were there mild and severe cases, but there were some which looked like chronic catarrhal conjunctivitis, and several which simulated the angular conjunctivitis due to the diplobacillus of Morax-Axenfeld.

He relates the history of a patient upon whom he operated for cataract; the operation was followed by pneumococcus infection, and the eye was lost; about the same time he had tonsillitis, which the examination of a smear showed to be pneumococcus infection. During these months of pneumococcus epidemic the writer contracted a pneumococcus conjunctivitis twice, the interval between the two attacks being two months, showing that there is no prolonged period of immunity.

"For a number of years different authors have endeavored to formulate definite typical clinical pictures caused by the several micro-organisms which produce a conjunctivitis, especially an acute one. From my experience and more especially from my experience during this recent pneumococcus epidemic, I cannot agree that this is possible. The clinical pictures vary so much with one and the same infectious agent that it is in almost every case of conjunctivitis impossible to say what micro-organism it is due to without a miscroscopical examination and often a culture test. Any one who makes these examinations in a methodical manner will, like myself, I am sure, be many times surprised at what he finds. Nor do I see wherein the advantage should lie in speaking of an acute conjunctivitis due to this micro-organism or that one, as interesting as it is from a scientific standpoint, since our methods of treatment are but little influenced by it. Silver salts are still the main agents to be relied upon in all forms of acute conjunctivitis, the only exception being the diplobacillus conjunctivitis in which zinc salts seem to be of greater value, and which by many is not looked upon as an acute form."

Finally he calls attention to a staining material which for months he has used with the greatest satisfaction in making smear specimens of the conjunctival secretion in his office, before treating the patient: This is the Azur II of the Giemsa staining solution for treponema pallidum. The air-dried smear being stained for 30 seconds with a drop of a 1:10000 solution of this stain, the surplus is washed off and the specimen after having been dried again can at once be examined. This stain in the short time of a few minutes gives a beautiful picture and a much clearer one than any other stain that he knows of. C. H. M.

Secondary Tuberculosis of the Conjunctiva.—Fage (*Annales d'Oculistique,* July, 1908), reports the following case: An unmarried woman, 23 years of age, without tubercular antecedents or tubercular disease in other organs, had a tumor of fungous character, the size of a hazel nut, in the region of the right lacrimal sac. There was swelling of the preauricular and submaxillary glands, but no lesion of the face or eyes. There was caries of the maxillary process with fungous masses in the maxillary sinus which was curetted.

Four years later the patient returned with lesion of the left conjunctiva. There were also a patch of lupus on the right side of the nose and three or four little ulcerations covered with crusts, and an ulceration in the right nasal fossa. The left eye was red and watery, its lids and bulbar conjunctiva were edematous, and there were vegetations on the tarsal conjunctiva. All the inflamed tissue was covered with mucopurulent shreds. The preauricular ganglion was swollen to the size of a cherry, but was not sensitive to pressure. This last is a valuable diagnostic sign, found according to Villard, in 85 per cent. of cases of conjunctival tuberculosis.

The instillation of a drop of tuberculin in the sound eye was followed in a few hours by intense conjunctivitis. The microscope showed a tuberculous form of tissue, but no Koch bacilli could be found. A fragment of diseased tissue inoculated in a guinea pig produced positive results.

The existence of primitive tuberculosis of the conjunctiva is now generally admitted. An exposed mucous membrane with numerous folds is well calculated to harbor the bacilli, and the rarity of the affection is explained by the action of the tears and the necessity of an excoriation as a point of entrance. Fuch's hypothesis of a slight traumatism seems more plausible than that the bacilli should enter through the tubular glands of the conjunctiva as suggested by Mitvalsky and Moissonnier.

A secondary infection may come from a distant focus, as a pulmonary or articular lesion, but this is rare, as bacilli carried by the blood current are more likely to be arrested in the iris or chorioid, and secondary tuberculosis of the conjunctiva is nearly always propagated by continuity. Lupus of the cheek or nose is the most frequent point of departure.

The author believes that, in the case reported, the tuberculosis was carried from the lupus of the lacrimal sac and maxillary sinus to the conjunctiva by means of the fingers or the handkerchief of the patient. G. C. H.

## CORNEA.

GREENISH COLORATION OF THE CORNEA.—SENN. WIL (*Wochensch. f. Therap. u. Hyg. d. Aug.*, Sept. 17, 1908). The author cites the case of Salus in which a greenish coloration of the cornea was observed in a man who worked as a sheep wool dyer and who was afflicted with multiple sclerosis. The corneal condition was attributed by Salus to trophic changes by which the hemoglobin of the blood corpuscles was probably changed to hemoverdin and imbibed by the cornea.

Senn believes the true explanation of the above to be that the condition was similar to the characteristic corneal affection seen in analine dyers reported by him in 1897. He saw as high as 18 cases in one establishment. There was more or less severe sepial brown coloration of the corneal tissue. In one of the cases recently re-examined there had occurred in the course of years a fading in part of the color. The opacity in the deeper parts and the amblyopia had remained. W. Z.

CONCERNING PARENCHYMATOUS KERATITIS AND INTERNAL CORNEAL ULCER.—v. HIPPEL, Heidelberg (*Graefe's Arch.*, lxviii, H. 2, May 17, 1908). The history of the case from which the specimen was secured was as follows: L. B., first seen September 11, 1897. For two years bilateral inflammation; spontaneous cure. Three years later another attack with loss of vision. Six months ago O. S. again inflamed. Examination showed: O.

D., central corneal macule, fine b. v. in cornea. O. S., pannus with gray-white exudate in places. Only lower inner quadrant clear. No loss of substance. Pupil fixed by posterior synechia. V-fingers at 1 M. Diagnosis: Interstitial keratitis. March 14, 1898, iridectomy O. S. Three and one-half years later, O. D. quiet, maculated cornea fine b. v. O. S. irritable. Iridectomy scar bulging. Opacities in the middle layer and gray-white tendinous opacities in the posterior layers or on the posterior surface. Fine deposits on the posterior surface. Epithelioma not smooth. Pupil dilated ad. max. Collection of pigment on capsule of lens near its centre. Nine months later only the periphery of the cornea is clear; rest densely leucomatous. Enucleation.

Microscopic study. Conjunctiva, episcleral and scleral vessels dilated and filled with blood, showing neither a pervasculitis nor any degeneration of the walls. Epithelial layer of the cornea abnormally thin. The normal character of the cells absent. Slight vascularization of the superficial layers, more pronounced in the middle layers and less in the deeper. The vessels are simple endothelial tubes with many overlying sheaths of plasma cells. Increase in the cellular elements in part, diffused over large areas, in part discrete collections of various sizes. In these latter, cells of many types; the larger with pale nuclei and broad protoplasm, lymphocytes and polynuclear cells; a few giant cells. Corneal lamellæ very irregular, in stretches only fragments visible. Necrotic areas in the lamellæ recognizable by faint staining. Incarceration of a connective tissue membrane in the posterior surface of the cornea, free only at its central part. Below this it is the thickest and is continuous through two defects in Descemet's membrane with the corneal substance. In other places it is firmly united with the iris. The author emphasizes two points: The diagnosis of ulcer of the posterior layers of the cornea was confirmed by anatomical findings.

The second case was one of parenchymatous keratitis in a 33 weeks, congenital syphilitic fetus. Schneider found within the cornea the spirochæte pallida. A corneal opacity was not recorded but was not looked for carefully. The case is in many respects interesting. It presents a parenchymatous keratitis of certain intrauterine origin. This is the first recorded instance in which the spirochæte pallida has been demonstrated in parenchymatous keratitis in man. This finding speaks in the greatest likelihood, but yet not with certainty that the entrance of the parasite into the cornea is preliminary to the inflammatory condition.

A third case, one of ulcus corneæ internum longenitum examined in a late stage of the disease is also recorded.

We are justified in assuming that the diagnosis was correct for other similar cases. 1. The similarity of the findings in this case with those in the new-born is greater than one would expect when it is recalled that the disease process in this case had lasted nine years. The author has no doubt but that the cases were identical.

2. Between these findings and those of Stock and Stanculean there exist great differences.

The case has a certain significance in explanation of the origin of congenital staphyloma of the cornea and leukoma, and agrees with the observations of Gallenga, Parsons and Seefelder. It makes no difference that in these cases the iris was attached to the cornea over a large area, as it is conclusively proven that such a surface synechia can occur without perforation of the cornea. In individual cases it would depend upon surrounding conditions whether an ectasic leukoma with deep anterior chamber resulted or a staphyloma with annihilation of the anterior chamber. He would not go so far as to assert that in all such cases a true ulcus internus must have preceded. It is possible that other congenital inflammations of the deep corneal layers could produce ectasia of that membrane.

To the author the important point is, as was also pointed out by Gallenga, Parsons and Seefelder, that ectasia as well as adherent leukoma and staphyloma can occur without purulent ulcerous inflammation of the superficial layers of the cornea and without purulent destruction of the same. W. Z.

The Treatment of Corneal Ulcerations.—Lee, Charles G., Liverpool (*Med. Press,* July 1, 1908). The writer recommends the following mixture of quinin and atropin as a most useful instillation in the early stages of corneal ulceration: Quinin sulphat. acidi, gr. ii; atropin sulphat., gr. ii; aquæ destill., dr. iv. Three or more drops to be instilled every four hours; should the ulceration be situated at the periphery of the cornea, eserin sulphate, gr. i, is substituted for the atropin.

He also recommends subconjunctival injections of 30 minims of a 1:1000 solution of oxycyanid of mercury, repeating in 48 hours if necessary, quoting Darier's conclusions of his observations on the effects of this method of treatment. C. H. M.

On So-Called Relapsing Erosion of the Cornea.—Cuperus, N. J., Zwolle, Holland (*Archiv fuer Augenheilkunde,* lxi, 1, 1908, p. 26). In the last few years Cuperus observed that the return of reflection and lack of staining of the cornea by fluorescein ascertained by daylight is no sufficient proof of healing. Focal illumination in such cases revealed an infiltration of the bottom of the erosion. which Cuperus considers as the cause of the relapses, as the epithelium over it is sufficiently restored, on some places it is uneven and thickened. He therefore proposes the term superficial ulcer of the cornea. Relapses may be prevented. if the patient is not dismissed before a uniform epithelial cover has formed, which can only be ascertained by focal illumination. A bandage must be applied as long as fluorescein creates the slightest green staining. In only a few cases scraping with sharp spoon and cauterization will be necessary.

C. Z.

A NEW CURE FOR FEBRILE HERPES OF THE CORNEA.—AMMANN, E.. Winterthur (*Archiv fuer Augenheilkunde*, lxi. 203. 1908, p. 194). The treatment consists in slight cauterization of the herpes configurations in their whole extent. point for point. with the galvanocautery. The galvanocautery must be minimally red glowing, so that the remaining maculæ be not noticeably denser than otherwise after longer lasting herpes. Ammann had excellent results in 11 cases which are reported. The prompt action of the galvanocautery would suggest a bacteriological nature of herpes.

C. Z.

A SO FAR UNKNOWN CORNEAL PHENOMENON IN ANESTHESIA OF THE FIFTH NERVE.—STERN, J., Bromberg (*Klinische Monatsblaetter fuer Augenheilkunde*, xlvi. 1. 1908. p. 467). observed in a poorly nourished woman, with supraorbital neuralgia, punctiform opacities of the anesthetic corneæ, which showed a constant change in coming and disappearing. They developed especially when the palpebral fissure was open and disappeared when the lids were closed for a short time. At the same time the epithelium showed slight dots, which also changed in appearance and disappearance with the opacities. The eyes were without irritation, not dry, and winking was not visibly diminished.

Stern saw similar phenomena, though not so marked, in five other cases, and attributes them to functional disturbances of the fifth nerve, which is followed by an impairment in the functions of the cells, so that they are not able to absorb from the surrounding nutritive fluid the substances necessary for their transparency and normal existence.

C. Z.

A Keratoplasty.—Lesser, Henry R., New York (*Med. Record,* Sept. 12, 1908). The writer reports an example of transplantation of the cornea of a rabbit to the human eye with retention of a certain degree of transparency; von Hippel's trephine was used and the operation performed in the usual manner; before operation there was a dense leukoma and vision was reduced to perception of light; three months after the operation the graft was in perfect apposition and the patient could count fingers at twelve inches. C. H. M.

## GENERAL DISEASES AND THE EYE.

Concerning Eye Affections Resulting From Alimentary Constitutional Infection.—Heilborn, Breslau (*Wochensch. f. Therap. u. Hyg. d. Aug.,* Oct. 22, 1908), reports two cases in which he believes the eye condition to have been due to alimentary infection. The first consisted of an iridocyclitis which relapsed. The day preceding the primary attack there was vomiting, and the day preceding the relapse there was a chill and slight fever. At this time the fundus was blurred. During the interim the temperature was normal. He points out that there is no relation between the severity of the primary infection and the secondary inflammation.

The second case occurred in a 60-year-old woman. There was a severe iridocyclitis. It was preceded by vomiting, fever and chills, palpitation of the heart and unconsciousness, lasting an hour and a half. In both cases no other possible etiological factor was present. W. Z.

Visual and Ocular Effects Associated With General Disease.—Taylor, James, London (*Med. Press,* Aug. 12, 1908), refers to two main groups, those associated with ocular complications, such as diplopia, and the purely visual disturbances such as those due to optic atrophy and so on. Paralysis of the external rectus may be due, he believes, to a neuritis from cold quite similar to the usual facial paralysis of a peripheral type. Other causes of ocular palsy are the toxin of diphtheria, which may cause ptosis or convergent squint or complete third nerve paralysis. In alcoholic neuritis, nystagmus and irregular motions are more common than palsy. Gummata of the nerves are the most common cause of isolated affections. Other cranial nerves may, however, suffer at the same time. Other nervous symptoms may be entirely wanting. Paralysis of the third nerve is frequent in commencing tabes and in general paralysis, and may be

due to some gummatous affection accompanying the truly degenerative lesions of tabes. Accordingly we often see the paralysis yield to treatment. In brain tumor paralysis may be due to mechanical compression by the growth or to indirect intracranial hypertension. In the last form the sixth nerve suffers most frequently, and the paralysis is apt to be partial. Of visual defects an interesting group is offered by the amblyopia due to tobacco. The urine should always be examined in these cases. In the presence of sugar, very small amounts of nicotine are sufficient to cause retrobulbar neuritis with characteristic symptoms. The optic atrophy of tabes offers a very bad prognosis. It may be the first and only symptom of the disease, and progress markedly in one eye before affecting the other. Knee jerks are by no means always absent. They may even be accentuated, although this suggests general paralysis. Ataxia is unusual in the cases with marked affection of the optic nerve. The pallid discs of disseminated sclerosis are the result of retrobulbar neuritis, but this so-called atrophy rarely leads to visual defect, the interstitial lesion in the nerve trunk being small. In some cases of albuminuric retinitis, no albumin can be detected, but the urine is of low specific gravity, and there is cardiac hypertrophy. Where these changes do not occur we are apt to attribute the retinitis with hemorrhages to an idiopathic arteriosclerosis. Occasionally this manifests itself suddenly as a thrombosis of the central vein or artery. The hemorrhagic condition may clear in quite a remarkable manner.
P. H. F.

MIKULICZ DISEASE WITH WELL MARKED TUBERCULOUS IRITIS. —KRAILSCHEIMER, Stuttgart (*Die Ophth. Kl.*, Aug. 5, 1908). The affected person was a merchant's apprentice of healthy parents. He had nine brothers and sisters living and healthy. The three eldest died in early childhood of children's diseases. Three years ago the patient suffered from pneumonia, but otherwise he has been well. The present trouble has been insidious. It began with dryness of the mouth and eyes and inflammation of the throat. Ten weeks later there was bilateral iridocyclitis, accompanied in O. D. by descemetitis. Beside the enlargement of the lacrimal the parotid and both submaxillary and sublingual glands the left Blandin-Nuhn gland (upon the under surface of the tip of the tongue) was palpable. The palatine glands were not enlarged. The glands in the neck, axilla and groin and at the elbow were enlarged. The spleen could not be palpated. Pulse 140. Heart boundaries normal. There was involvement of the lungs. Urine and blood normal. The left eye quieted under treatment, but the right later developed nodules in the iris, one at the pupillary border, the other at the angle of the anterior chamber.

Microscopic study of the axillary glands showed interstitial inflammation with numerous tubercles and giant cells in the stroma and in the lobes of the glands. Injections of tuberculin (old) were positive. Here we have Mikulicz's disease associated with tuberculous iritis and tuberculous glands, but whether the former was caused by the latter or the lymphadenoid disease predisposed to tuberculous infection cannot with certainty be declared.

W. Z.

A Clinical Study of Tuberculosis of the Fundus Oculi.—Krauss, W., Marburg, and Brueckner, A., Wuerzburg (*Arch. Ophthal.*, N. Y., September, 1908, xxxvii, 544. Abridged Translation from the German Edition by Dr. Percy Fridenberg, New York), report in detail two cases of tuberculosis of the fundus oculi. Both cases gave a family history of tuberculosis, and both dated the ocular disease from an unimportant eye injury. The two cases showed the following similar conditions: Involvement of the left eye only, loss of central vision, with corresponding defect in the field of vision, limitation of the disease to the posterior half of the eye with involvement of the vitreous. There were multiple hemorrhages, yellow-gray deposits, pin-head-size protruding white dots, retinal detachment with a surrounding zone of white discoloration, and lack of pigment deposits.

Following the injection of tuberculin there were fresh hemorrhages. In one case there was an accompanying pulmonary involvement; in the other case there was no evidence of extraocular tuberculosis.

The authors believe the ocular disease to be due to tuberculosis, of a chronic course, affecting the retina chiefly and the chorioid to some extent. The diagnosis was based on the heredity, the course of the disease and the reaction to tuberculin. The authors believe that tuberculosis of the eye, particularly of the fundus, is not uncommon and can be demonstrated only by a local reaction, in the fundus, to tuberculin.

W. R. M.

The Pupil in Extraocular Disease.—Cornwell, Herbert C. de V., New York City (*American Medicine*, October, 1908). The author calls attention to several important anatomical facts. The pupillary changes found in various pathological conditions are described. He says that in all nutritional diseases affecting the nervous system there are not, as a rule, pupillary changes. One of the first and earliest and most constant phenomena in paresis is inequality of the pupils with a sluggish reaction to light, both direct and consensual. The tendency of the sluggishness is to be more marked in one eye than in the other. In addition to the Argyll-Robertson pupil in tabes, he calls attention to its occurrence in paresis and syphilis of the nervous system. In traumatic lesions there is ordinarily an inequality of the pupils, the larger one usually being on the side of the lesion. In the meningeal infections, especially of the vertex, the pupils are usually contracted at first, later dilated and frequently unequal. The same is generally true when the base is affected, except that other cranial nerves are more universally involved than in the vertex infections. High injuries to the cord, spinal syringomyelia and neoplasms of the cord, may produce, through their influence upon the sympathetic, distinctive pupillary changes, most frequently unilateral. M. D. S.

SUGGESTIONS OF THE PUPIL IN GENERAL DISEASE.—JACKSON, EDWARD, Denver, Colo. (*Am. Journ. Med. Sciences,* October, 1908). The writer claims that although the pupil furnishes no pathognomonic symptoms of general disease, and although Swanzy says that "the condition of the pupils, whether normal, contracted or dilated, is of very slight significance or value in the diagnosis either of the position or of the kind of any intracranial lesion," nevertheless the pupil is enormously suggestive to any one who is on the lookout for clues. The pupil reacts so readily and to so many different influences that in the present state of our knowledge we are quite unable to interpret with certainty its behavior in disease. Unilateral dilatation of the pupil may indicate the existence of an intracranial lesion, and it may also point to the affected side in pulmonary tuberculosis.

"Pernot, who examined 1,140 cases of phthisis, found inequality of the pupils present in 6 per cent. of cases in the first stage, in 8 per cent. of those in the second stage, and in 14 per cent. of the patients who had reached the third stage. The altered pupil was on the same side as the chief pulmonary lesion. In the first stage the pupil was dilated. In the second stage it was sometimes dilated and sometimes contracted on the side of the lesion. In the third stage the change was more generally a contraction. The probable explanation of the phenomenon is that the pulmonary disease acts through the sympathetic, an irritative lesion causing contraction of the dilator muscle of the iris. Later in the disease destruction of the affected fibers produces a paralysis of the dilator, and consequent miosis."

Signorelli concluded that inequality of the pupils in general indicates the side of the body on which the lesion is situated. Disturbances of the pupil are generally mentioned as one of the symptoms of disease affecting the arch of the aorta, being due to involvement of the cervical sympathetic in the local disease—initiative conditions causing dilatation, destructive lesions, miosis; but Babinski suggested that the real cause of the variations of the pupils in such cases was syphilis.

All abnormalities of the pupil not due to temporary causes are very suggestive of syphilis. Recent writers have advanced and strongly supported the view that the loss of the light reflex, with preservation of other pupil movements (the Argyll-Robertson symptom), was not a symptom of locomotor ataxia, but a symptom of syphilis.

At an altitude as high as Denver (5,280 feet) cases of partial ophthalmoplegia interna occur more frequently than elsewhere; such dilatation is always accompanied by weakness of accommodation, and one eye is always more affected than the other; such cases are always benefited by sojourn at a low altitude.

C. H. M.

DOUBLE OCULAR NEURITIS FOLLOWING VARIOLA.—CHAVERNAC (*Annales d'Oculistique,* July, 1908) reports this case which, he says, is only the second on record, though cases of optic neuritis occurring in connection with variola, varioloid, scarlatina and measles have been reported.

Though the patient has been submitted to thorough mercurial treatment without benefit, he improved under the use of subconjunctival injections of hetol given for their lymphagogue effect.

The author thinks that mercury should be used with great discretion in infectious optic neuritis, as there is danger of adding mercurial intoxication to the existing toxin. G. C. H.

ON OPTIC NEURITIS IN MULTIPLE SCLEROSIS.—BAGH, KURT, St. Petersburg. (From the eye clinic of Prof. W. Uhthoff in the University of Breslau. *Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 11, 1908, p. 10.) Recently more attention has been devoted to the relatively frequent occurrence of optic neuritis and acute retrobulbar neuritis in disseminated sclerosis. Either of them is of great value for the early diagnosis of multiple sclerosis, as it is sometimes the only symptom which may precede those of the brain and spinal cord for a long time. In the four cases reported by the author, optic neuritis was previous to the general affection in one case 10 years. In all the visual disturbances set in suddenly, but soon an improvement took place. The futility and fluctuations of the whole clinical aspect, especially of vision and visual field, were also very characteristic. In disseminated sclerosis vision may be abolished in a very short time, but the prognosis is favorable and the sight may be completely or partially restored. Further statistics are required as to the frequency of optic or retrobulbar neuritis in multiple sclerosis. While Fleischer assumed 90 per cent., the observations from Schoeler's clinic yielded only 16 per cent. as far as retrobulbar neuritis, not caused by intoxications, was concerned. Bagh thinks that this percentage is too low. C. Z.

## GLAUCOMA.

Glaucoma as a Sequel to Leucoma Adherens.—Fuchs, Ernest, Vienna (*The Lancet,* Aug. 8, 1908). It was admitted that increased tension was not an unusual sequel to the production of anterior synechiæ or leucoma adherens, and that this was caused by the obliteration of the angle of the anterior chamber. His endeavor has been to ascertain how the blocking of the angle was brought about and why increase in tension occurred in some cases and not in others apparently exactly similar. It appeared that inflammation of the cornea caused a thickening or bulging inwards of the pectinate ligament, which was met by a fold of swollen iris; the two adhered and formed a ring-shaped canal, after the manner shown by Priestley Smith. This canal was liable to complete obliteration or filling with lymph. If the cornea did not perforate, reformation of the angle was likely, but if it did perforate, the blockage was permanent, for the loss of aqueous brought the swollen iris into direct contact with the inflamed cornea, a contact that was effective by reason of the forward pressure of the inflamed ciliary processus and perhaps also of the contents of the posterior chamber. This application might proceed to adhesion, in which case the epithelium of the cornea and iris was lost and the surfaces united, either directly or by the interposition of a thin layer of new tissue. C. H. M.

Glaucoma Due to Intumescent Senile Cataract.—Isaacs, Dr., Omaha (From the eye clinic of Prof. Th. Axenfeld in the University of Freiburg, i. Br. *Klinische Monatsblaetter fuer*

*Augenheilkunde,* xlvi. 1, 1908, p. 640). The right eye of a man, aged 80, presenting the aspect of typical inflammatory glaucoma. The cornea was hazy, iris discolored, the pupil was enlarged and immovable, anterior chamber shallow. There was a very much swollen cataract with broad spokes of a lustre like mother of pearl. Perception of light and projection good, with slight nasal contraction of the visual field on weak illumination. Tension +3. Upon eserin 0.5 per cent. and hot compresses the glaucomatous attack abated. Tension was a little higher than in left eye. Therefore the operation was not performed. Under instillations of eserin, twice a day, the anterior chamber became deeper within a few months, and after a year the eye presented the appearance of an ordinary uncomplicated cataract.

Isaacs concludes that it is perhaps more correct in such cases not to operate immediately, but to attempt conservative treatment. The subsequent extraction will certainly be more favorable than during the glaucomatous attack. The incident literature is quoted. C. Z.

About Sclerosis of the Reticulum Sclerocorneale in Glaucoma.—De Vries, W. M. (*Tydschr. v. Gen.,* June 15, 1907), mentions that Polya found that among 438 in the literature described cases of anatomically examined eyes with different forms of glaucoma, 350 times the angle of the anterior chamber was entirely closed, 25 times partly, and only 38 times entirely open. This small minority, of course, must show us more exactly the connection existing between the closure of the camera-angle and glaucoma. If we can find cases where glaucoma exists with entirely normal camera-angle, then the interpretation becomes much more probable that the closure of camera-angle is only a secondary phenomenon. However, the probability exists that in eyes with open camera-angle changes in that spot are present, which have the same significance for the lymph-circulation as obstruction of the camera-angle. The aim of the examination becomes thus displaced; it is not enough to demonstrate that the camera-angle is not closed; it must be demonstrated that this angle is everywhere open, and that other changes, which may explain a hindrance to the escape of the lymph, are absent. Among these changes pigment-embolism of the reticulum sclerocorneale and the defective development of Schlemm's canal belong—as also the soc. sclerosis of the reticulum sclerocorneale, a case of which De Vries examined. The patient, a woman 55 years old, complained of pain in the right eye and headache.

She had been always near-sighted, and the right eye the worst; some years previous it had twice been hurt seriously. She did not know how long the eye was perfectly blind. The cornea was hazy, with slight pericorneal injection and a few clear vesicles in its lower part; the anterior chamber deep, even deeper than in the left eye; pupil somewhat too wide; vision zero; tension +3; strabismus divergens. Pilocarpin reduced the tension slightly temporarily and the haziness of the cornea, so that fine brown precipitates became visible on the Descemet membrane; also cyclitis with high tension had therefore to be considered. New vesicles recurring in the cornea, the painful eye was enucleated. After fixation in 10 per cent. formalin and hardening in alcohol the measures were as follows: Corneal horizontal 11.5 mm., vertical 11 mm. Bulb: Length of the axis 31 mm. (which is therefore a little too small), horizontal 28. vertical 24 mm. Except epithelial defects, no changes in the anterior part of the cornea. Descemet's membrane intact, the endothelium somewhat flat and thin; here and there small pigmented cell masses. The anterior chamber is deep; the form of the angle is normal. The lens is flat. The ciliary body has myopic configuration, with very few circular muscle-bands in the ciliary muscle. The processus ciliares are slightly sclerotic. In the root of the iris and the bordering part of the processus ciliares slight increase in round cells, without being a distinct infiltration. The reticulum corneosclerale is much poorer with nuclei than normal, and Schlemm's canal can be detected only with difficulty; towards the anterior chamber it is limited not with interrupted lines, trabecles, but with a homogeneous membrane, which shows some endothelial nuclei towards the side of the chamber, and resembles Descemet's membrane, which last one ought not to reach so far peripherically. As the membrane is interrupted by an endothelial cell, it cannot be Descemet's membrane. In coupes of the normal reticulum a dark central part contrasts with a clear peripherial part. In many coupes this clear homogeneous periphery of the trabecles is joined together, while the endothelial nuclei are especially absent.

In the region of the staphyloma posticum, just above the macular region, the sclera and chorioid are interrupted, through which the nuclear layers of the retina protuberate like a hernia. The opening in sclera and chorioid is 0.3 mm. long and 0.1 mm. broad. The thickness of the sclera on both sides of the dehiscense is 0.1 and 0.12 mm. (normally 0.5 to 1.3 mm.). This anomaly is not connected with glaucoma, and it does not look like a staphyloma caused by glaucoma.

Sclerosis of the reticulum sclerocorneale is described by Tartuferi, Sarti, Leber and Bentzen and Polya. These cases do not explain why sclerosis of the reticulum sclerocorneale happened, while as a rule the angle of the chamber becomes closed. Imagining that in an eye in which glaucoma is going to develop irritating substances are secreted, which leave the eye with the lymph circulation, act deleterious and the endothelium is cast off and disappears (in some cases cellular infiltration, in others connective tissue formation with secondary shriveling arise), the surfaces freed from endothelium grow together and produce closure of the filtration chamber angle. It is easy to imagine chemical or anatomical conditions through which chiefly the endothelium of the reticulum sclerocorneale, through which most of the lymph passes, suffers. In those cases the endothelium in this reticulum will be cast off and secondarily the trabecules grow together, w. o. w. anatomically the number of nuclei will be found too small and the normal openings in this reticulum failing.

Endothelium lesions in a glaucomatous eye are not supposed for the sake of the theory; in a case of glaucoma after luxation of the lens De Vries found the endothelium of Descemet's membrane failing in a number of coupes.

With ulcus corneæ in a glaucomatous eye the endothelium of Descemet's membrane casts off quickly in many cases. In many others the endothelium is excited to proliferation, it grows further than normally, over the filtration chamber angle on the anterior surface of the iris, and forms a membrane there and in the chamber angle corresponding with Descemet's membrane. We may also suppose an epithelium lesion of the iris endothelium; its crypts conduct the aqueous humor in the perivascular lymph spaces of the iris. Lesion of the iris surface and crypts can lead to the iris stroma becoming more compact and shriveling, which shows itself often in the glaucomatous eye as ectropion uveæ.

Closure of the iridocorneal angle, sclerosis of the reticulum corneosclerale and shriveling of the anterior layers of the iris, which leads to ectropion uveæ, can have one cause, namely, the presence of substances in the eye which are deleterious for the lymph vessels, thus an inflammatory cause. Later examinations must teach us why so seldom this sclerosis occurs and so often the closure of the iridocorneal angle. E. E. B.

## INJURIES.

Contribution to the Knowledge of Injuries of the Eye by Pieces of Copper.—Caspar, L., Muehlheim a. Rh. (*Klinische Monatsblaetter fuer Augenheilkunde*, xlvi. 11, 1908, p. 179). Injuries of the deeper portions of the eye by copper are considered to be of evil prognosis. Leber showed that copper is very apt to arouse suppuration in the vascular parts of the eye even without introduction of bacteria. On the other hand, copper imbedded in the avascular parts, e. g., the lens, may be well borne. Especially unfavorable are those cases in which the foreign body penetrated into the vitreous, as their extraction may be very difficult or impossible.

Caspar gives a review of such observations from literature and reports a case of his own. At first it seemed as if the piece of copper, which had entered the vitreous by an explosion, would be tolerated with preservation of good vision. A year later, however, the existence of the eye was threatened by a very painful iridocyclitis. After several unsuccessful attempts of extraction through meridional section, under control of the ophthalmoscope, Caspar finally succeeded, without the aid of the ophthalmoscope, in grasping the piece with an iris forceps.

A considerable brownish red opacity of the vitreous followed the operation, which, under atropin and mercurial inunctions, gradually cleared up with resulting moderate but practically useful vision. The peculiar color of the vitreous and iris and very fine deposits of the lens capsule probably were symptoms of chalkosis, although its late disappearance might be raised as argument against this assumption, at least with reference to siderosis, which never disappears. With regard to the further prognosis, Caspar is rather reserved, as the slight changes of the vitreous still present may be an enduring menace to the eye.

C. Z.

Two Cases of Steel in the Interior of the Eye and Their Successful Treatment.—Burnham, G. Herbert, Toronto (*The Canada Lancet*, June, 1908). In the first case the magnet was used several days after the steel had entered the eye and two hours were required for its successful extraction. In the second case a delay in getting the magnet caused an exudate to surround the steel, and it required one hour and a quarter to extract it.

The shorter the time after the lodgment of a piece of steel in the interior of the eye the magnet is used, the better.

Alloys of iron may be wholly or nearly non-magnetic, and special steels differ widely in their behavior when placed in the magnetic field.

Referring to the danger of sympathetic ophthalmia following steel injuries to the eye, the writer states that of this justly dreaded affection he has not the same fear as oculists in general seem to have, and expresses full confidence in an ability successfully to treat sympathetic inflammation. F. A. and P. G.

THE USE OF CHEAP HAMMERS AS A FACTOR IN PENETRATING WOUNDS OF THE EYE.—AYRES, S. C., Cincinnati, Ohio (*Amer. Journ. Ophthalmology,* May, 1908). The writer has studied the character and condition of the tools used by mechanics and the manner in which penetrating wounds of the eye were received. He found that generally the injury was inflicted by fragments flying off while the mechanic was striking a chisel or piece of metal or a hatchet with a hammer; that the hammer was usually a cheap one, and that the purchase of hammers of better quality would prevent such accidents to a considerable degree.

An all-steel hammer costs about $1.25. The kind usually purchased costs about 35 cents and is made from a low carbon tool steel the outside of which is hardened or tempered to the extent of about a sixteenth of an inch; the metal beneath the outside casing is soft and porous; repeated blows on the face of this hammer drive away this softer metal from the outside shell, thus leaving a space, and allowing the shell to crack and chip off from the edge of the hammer-face. C. H. M.

PIECE OF STEEL IN THE EYE SEVENTEEN YEARS.—DICKEY, J. L., Wheeling (*West Virginia Med. Jour.,* July, 1908), reports a case in which the patient had been injured in the eye by a piece of steel seventeen years previous to the time when the writer was consulted. The eyeball showed signs of degeneration and was painful and inflamed. Enucleation was done and the eyeball found firmly attached to the orbital tissue, in the region of the optic nerve, by dense bands of adhesions. A piece of steel, the size of a buckshot, was found lying on the floor of the eyeball in the lower anterior quadrant. W. R. M.

A CASE OF SIDIROSIS OF THE RIGHT EYE, CAUSED BY A PIECE OF IRON-SCALE, WHICH THE X-RAY FAILED TO LOCATE.—MUETZE, HENRY, St. Louis (*Ophthalmic Record,* September, 1908). A man, aged 49, while cutting a bolt, was stuck in the eye by a piece of iron-scale, causing a penetrating wound of cornea, iris and lens. The eye remained quiet for a year with good vision. The lens then became opaque, the iris dark in color and the eye inflamed from iridocyclitis. The lens was extracted. No metal was found. The eye is making a slow recovery. An X-ray plate was made shortly after the injury, but gave no evidence of a foreign body in the eye, notwithstanding something could be seen in the lens which looked like one. M. B.

On the Protective Influence Exerted by the Iris in Perforated Wounds of the Cornea.—Tooke, Fred T., Montreal (*Ophthalmic Record,* August, 1908). The wound of the cornea is frequently of an infective nature, be it a perforated ulcer or a perforation due to the entrance of a foreign body. By walling off the infected sides of the incision, an effort is made to ward off the entrance of bacteria into the anterior chamber and to avoid subsequent panophthalmitis. Beyond this purely mechanical action the blood vessels of the iris assist in carrying off the localized infection to the general circulation, thus preventing subsequent necrosis of the cornea. A second feature, noted by the presentation of the iris, is that the process of actual healing or of granulation tissue formation is materially assisted; that after draining away the infective agencies the number of leucocytes supplied by the blood vessels of the iris readily assist in the formation of new connective tissue elements. This tends to permanently close the perforation, and allows the reformation of the protective epithelial strata of the cornea. Besides completely filling the gap in the cornea and preventing any escape of the aqueous humor, the anterior chamber is restored and the intraocular circulation re-established.

It cannot be denied that many lamentable results are avoidable by performing an iridectomy or by releasing the anterior synechia. The author does not advocate Nature's method as being superior to surgical interference, but presents it as the means Nature adopts for closing an infected hole in the cornea in a most effectual manner. M. B.

A Piece of Steel Weighing Less Than a Milligram Successfully Removed from the Vitreous, with Resulting Normal Vision.—Spratt, C. N., Minneapolis (*Ophthalmic Record,* September, 1908). A machinist was struck in the eye by a particle from a cold chisel. Eight days later he consulted an ophthalmologist, who made an unsuccessful attempt to remove the foreign body with a giant magnet. Two days later the author was consulted, who, after locating the foreign body by Hulen's method, successfully extracted it through an incision in the sclera 14 mm. behind the temporal corneal margin. At the time of the operation there was pus in the anterior chamber and cloudy vitreous. Three months later the eye had vision of 6/v. The ophthalmoscope showed a yellowish spindle-shaped scar posterior to the macula and a little below a crescent-shaped area in the retina caused by the steel. The author recommends, in all cases, that the situation of the foreign body be accurately determined, and that an incision be made at the nearest point in the sclera, through which the foreign body is to be removed with the tip of a powerful hand magnet. M. B.

Contusion of the Eyeball, with Special Reference to Traumatic Aniridia and Aphakia.—Fejer, Julius, Budapest (*Arch. Ophthal.*, New York, September, 1908, xxxvii, 568. Abridged Translation from the German Edition by Dr. M. L. Foster), discusses, in general, the subject of contusion of the eyeball and reports a case in which a blow on the anterior segment of the eyeball caused a dislocation of the entire iris and lens into the vitreous. There was no injury to the sclera, the anterior chamber was deep, iris and lens absent from the anterior portion of the eye, and ciliary processus invisible. Deep in the eye could be seen a solid body, probably a portion of the iris and lens, which later became atrophied and partially absorbed.

W. R. M.

Subconjunctival Pigmentation After Traumatic Rupture of the Sclera.—Leonhardt, Heidelberg (*Graefe's Arch.*, lxviii, H. iii, July 14, 1908). The comparative rarity of pigment deposition accompanying contused wounds with rupture of the sclera and traumatic coloboma of the iris (particularly aniridia) is the reason given by the author for the report of such a case. He summarizes the findings as follows: An extensive subconjunctival scleral rupture with an underlying dark pigmented area which may have been either a continuation of the first or an independent rupture, or there may have been no rupture of the sclera at all at this point. The determined rupture was in the usual position—up and in and concentric with the corneal limbus—and removed several millimeters therefrom. The explanation of this predilection is the resistance offered by the trochlea and the weakening of the sclera at this position by the grooving occasioned by Schlemm's canal. It is worthy of remark that traumatic coloboma of the iris, when directed towards the staphyloma, points to an indirect rupture. In some cases there occurs total aniridia, with or without dislocation of the lens. In this case the lens was absent. In a number of cases the lens was luxated beneath the conjunctiva or was expelled entirely from the eye through bursting of the conjunctiva. In only a few cases was vision as good as in this case. +10=5/x.

The source of the pigmentation of the lower half of the conjunctiva which makes this case remarkable is problematic. That it was not of hemic origin is shown by the fact that one hour after the accident the conjunctiva was blue black in the lower half and over the rupture, and this was even more marked eight days later, after the ecchymosis had disappeared. It is very likely that primarily incarceration and infolding of the iris into the scleral wound took place and pigment was detached and washed by the blood beneath the conjunctiva. It is also possible that the ciliary body, with its rich pigment, was drawn towards the rupture and pigment particles were detached and commingled with blood, and finally that in the same manner some of the pigment may have been derived from the chorioid. W. Z.

Chorioidal Abscess Behind the Macula Lutea After Perforating Injury by a Gun Cartridge; a Contribution to the Formation of Holes in the Centre of the Retina.—Cohen, Curt, Breslau (From the eye clinic of Prof. O. Haab in the University of Zurich. *Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 1, 1908, p. 620). The left eye of a man, aged 20, was injured by the explosion of a gun cartridge, and was enucleated on the eleventh day after the symptoms of panophthalmitis had developed. The histological condition, which is described in detail, showed that the foreign body was lodged on the disc, causing an inflammation of the retina, with subsequent inflammatory exudation and infiltration of the vitreous, then infiltration of the chorioid, with formation of an abscess in the chorioid at the region of the macula. Violent exudation from this abscess through the basal membrane followed, bursting of the pigment epithelium, subretinal accumulation of the inflammatory products under the macula, detachment of the macula under increasing accumulation of leucocytes and inflammatory edema. Finally, after two days, the retina was perforated in the fovea, and through this hole pus oozed into the vitreous. A blood vessel was ruptured and the blood filled the hole. The inflammation was propagated to the anterior segment, producing iridocyclitis and hypopion.

The recent character of the hemorrhage proved that it was secondary, and that the macula was not ruptured directly or indirectly by the injury. The other possibility that the hole in the macula was caused by a process from the vitreous towards the chorioid could also be excluded by the lacking connection of the infiltrations of the vitreous, which were confined to the anterior portions, with the pus of the hole of the macula, and by the character of the pathological products. For the predilection of the formation of holes in the macula, Cohen emphasizes the peculiar vascular supply of the chorioid in the macular region, and the greater vulnerability of the macula, on account of its architecture. The case showed that the chorioid may play an important part in the etiology of the formation of holes at the macula. The literature, from the first description of Haab, is reviewed, and the histologic conditions illustrated on a colored plate. C. Z.

CONTRIBUTION TO THE ETIOLOGY OF DIPLOPIA DUE TO HEAD INJURIES.—ELZE, Zwickau (*Wochensch. f. Therap. u. Hyg. d. Aug.,* Oct. 1, 1908). In the first case, six months before the examination there had been concussion of the brain, with symptoms indicating labyrinthine disease and involvement of the semicircular canal on the left side. The subjective symptoms were diplopia and tinnitus. There was homonymous diplopia in all directions, with no change in the relative distance of the two images. The fundi were normal except for a slight pallor of the left optic nerve (not atrophied). Color perception was somewhat subnormal.

In the second case the history and symptoms were similar. No spontaneous diplopia, but with Maddox rod and double images close together, widening on lateral deviation to the right or left.

That the ocular disturbance is due to changes in the semicircular canal and not to labyrinthine disease is shown in a case reported by the author, in which the auditory nerve was greatly damaged in its peripheral distribution and was not accompanied by any ocular symptoms. W. Z.

INJURY OF EYE BY OBSTETRICAL FORCEPS.—PICK, L., Koenigsberg i. Pr. (*Deutsche Medizinische Wochenschrift,* 1908, No. 24, p. 1073). When the child came under treatment, one week after birth, there were suggillations of the lids and exophthalmus, 4 to 5 mm., with preserved motility, but total, milkwhite opacity of the cornea of left eye. The course was favorable and the cornea was clearing up.

The injury was caused by pressure of one blade of the forceps on the orbit (infraction) and the eyeball, which produced edema of the cornea and ruptures of Descemet's membrane. The prognosis must be guarded, as occasionally hydrophthalmus may develop in such cases. C. Z.

EXPERIENCES ON INJURIES THROUGH LIGHTNING AND ELECTRICITY.—PFAHL, DR., Bonn (*Deutsche Medizinische Wochenschrift,* 1908, No. 29, p. 1267), reports nine cases. In all injuries through lightning the patients lost consciousness, and showed, except one, organic lesions for some time after the accident. In five, the eyes were affected; disturbances of circulation at the disc, extravasation of blood into the cornea, insufficiency of accommodation, sensitiveness to light; in one case detachment of the retina. Pfahl urgently advises early examination of the eyes in all cases of injuries from lightning and electricity. C. Z.

WOUND INFECTION BY BLENNORRHEA NEONATORUM?—SCHOELER, F. (*Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 11, 1908, p. 58). A man, aged 43, morphine fiend, and orderly at the eye clinic of Prof. Schoeler, infected his right index finger with pus of a blennorrhoic child, and suffered enormous pain during the night. The next day he was admitted to the surgical clinic of Prof. Bier and examined by Dr. Joseph. The finger was very much swollen and discharged from an erosion thin pus, which microscopically looked gonorrheic and contained Gram negative diplococci in form of gonococci, especially in the leucocytes, but no cultures were made. He was treated by passive congestion, but after about a week an abscess formed at the dorsal surface of the hand, which was incised. Then an abscess formed on the left thigh after an injection of morphin. The wound at the hand had a bad appearance. Two weeks later the patient became septic, was icteric, had chills and 40.40/c. His feet swelled and an abscess formed under the left toe. The examination of the blood was negative. He died about four weeks after the infection.

In his review on gonorrheic general infection and metastases C. von Hofmann (*Centralblatt fuer die Grenzgiebiete der Medicin and Chirurgie,* vi, No. 7) collected 400 cases from 1890 to 1903, out of which only one was not metastatic. On the other hand, Schleich published eight cases of severe and protracted infections of wounds of the fingers with gonorrheic secretions. Seven of these occurred in physicians, and the affection was therefore called "physician's disease." As the possibility cannot be denied that the infection in Schoeler's case, terminating fatally, was due to gonococci, he considered it his duty to publish this case to warn against this danger. C. Z.

Hematoma of Both Optic Sheaths in Diabetes and Fractures of the Base of the Skull.—Oishi, S., Tokio (From the eye clinic of Prof. R. Greeff in the University of Berlin. *Archiv fuer Augenheilkunde,* lxi, 1, 1908, p. 17), describes clinically and anatomically a case of each kind. In both the blood from the cranial cavity entered the intervaginal spaces along the osseous optic canals. In the diabetic case the largest amount of blood filled the posterior quarter of the pia-arachnoidal and the anterior three-quarters of the dura-arachnoidal spaces; in the case of fracture of the skull the blood was found chiefly between dural and arachnoidal sheaths. In both cases there was an ampullar expansion of the optic nerve. In the first case there was no papillitis, but a cellular infiltration of the supporting tissue, most likely a sequel to the long-standing diabetes. The choked disc in the second case undoubtedly was due to mechanical influences, as there were very slight inflammatory symptoms. Both cases presented the phenomena subsequent to hematoma of the dura mater. C. Z.

Traumatic Enophthalmos.—Dunn, Percy, London (*Lancet,* Aug. 15, 1908), in a lecture delivered at the West London Post-Graduate College, refers to shrinkage (meaning sinking into the orbit) of the eyeball as due to fracture of the orbit, in which case it is virtually a dislocation of the globe, to retraction through the medium of scar tissue, and to the cases of spontaneous recession without other appreciable lesion, after eye injuries. These cases are apt to be overlooked, and are probably not very rare. The main symptoms, enophthalmos, ptosis, narrowing of the palpebral fissure and diminution of tension, may be very variable in onset, duration and intensity. Optic atrophy and oculomotor paralyses may be the expression of complicating injuries. Beer maintained that the enophthalmos was due to absorption of the orbital cellular and fatty tissue caused by a lesion of the trophic peripheral nerves. This is improbable. Schapringer attributes the condition to traumatic paralysis of the sympathetic. This would be logical only on the basis of a paralysis of Mueller's muscle. It would also explain the ptosis and narrowing of the palpebral fissure, which are, however, in part, undoubtedly mechanical results of the recession of the globe, as well as the miosis, diminution of intraocular tension and changes in the vascular supply of the face on the affected side. The enophthalmos, Dunn thinks, is mainly due to loss of tonus in the check ligaments of Tenon's capsule, and the site of the sympathetic lesion is in the lenticular ganglion, and an expression of direct injury by contusion or compression. This might also explain the frequency of abducens paralysis with traumatic enophthalmos, as the sixth nerve obtains some of its supply from the sympathetic. The vascular changes in the skin of the face are absent in direct injury of the lenticular ganglion, and show a lesion of the cervical sympathetic. Uncomplicated cases of traumatic enophthalmos are rare, and recovery is infrequent. P. H. F.

A CASE OF SUDDEN DEATH IN THE COURSE OF A TRAUMATIC IRIDOCYCLITIS.—VILLARD (*Annales d'Oculistique*, May, 1908) reports a case resulting from a minute wound in the ciliary region by a fragment of steel which was removed immediately after the accident. There was nothing remarkable in the progress of the case until the twenty-fifth day, when the patient, without any warning, suddenly fell back upon his bed and died instantly. There was no autopsy.

The author thinks that the cause of death was a cerebral embolus originating in the veins of the orbit, but it seems more likely that the man died of heart disease. G. C. H.

ATROPHY OF THE OPTIC NERVE CONSECUTIVE TO TRAUMA OF THE HEAD.—JOCQS (*La Clinique Ophtalmologique*, May 25, 1908). Medicolegal reports of accidents occurring to persons working in the various industries should of necessity be exact as to the determination of the etiology and prognosis of certain visual troubles such as amblyopia and amaurosis following traumatism of the head.

Many cases of amaurosis follow, as is well known, a blow on the head, of which the pathogeny is an indirect fracture through the optic canal, or an effusion of blood in the nerve sheath. But more frequently it is the case where, following a trauma of the cranium, the injured person, in good faith or not, claims the visual loss to be due to the injury, while the lessened vision may have existed prior to the accident. Of course, when the case is seen just after the trauma and amaurosis exists, it is impossible, before some days have elapsed, to discover any optic nerve change. Optic nerve atrophy will follow in a short time. The optic papilla will guide in these cases. When the case is seen long after the accident, while the etiology is determined with less certainty, nevertheless to the trauma of the cranium may be attributed the cause if the contour of the atrophied papilla is clear. The arteries may have preserved their caliber, it rarely happening that they become less in size from pressure on the nerve at the level of the optic foramen. B. E. F.

Complete but Temporary Paralysis of the Elevator of the Upper Lid Following a Subconjunctival Injection of a 10 Per Cent. Salt Solution.—Villard (*La Clinique Ophtalmologique,* June 10, 1908). The case Villard reports was in a man 59 years of age, who was myopic and in whom there was retinal detachment. The day following the injection the upper eyelid was found to be much swollen, with inability of the patient to raise it. In two weeks the palpebral paralysis had disappeared.
B. E. F.

## INSTRUMENTS AND METHODS OF EXAMINATION.

A New Knife and Method for Iridotomy.—Jobson, Geo. B., Franklin, Pa. (*Ophthalmic Record,* September, 1908.) The knife is set at the end of the shank at such an angle and is of a size which enables the operator to introduce it at the sclerocorneal junction on the flat and then pass it to the opposite side of the anterior chamber, when it is turned; the point of the blade then engages the iris and is pushed through it at a point to one side of the median line. The blade, being set at an angle to the shank, cuts easily through the iris as it is drawn toward its point of entrance. A similar incision is then made in the iris on the other side of the median line. These two incisions converge and meet above as near the sclerocorneal puncture as possible. A triangular flap is thus liberated in the iris, with its base attachment below. This flap can be dealt with by making an incision below and pulling the flap out and cutting it off. M. B.

A New Applantation Ophthalmotonometer.—Cobern, E. B., New York (*Ann. Ophthal.,* July, 1908). This instrument is composed of a mercury manometer with a scale, a glass tube of hour-glass shape, one end of which is covered with a rubber diaphragm, the other attached to a rubber tube which connects it with the manometer. At the centre of this rubber tube is a connection with a rubber bulb. Some colored water is put in the hour-glass-shaped tube and the rubber diaphragm end pressed against the cornea of the eye until the latter dimples, and the diaphragm is pushed inward; this causes the colored water to rise in the tube. Pressure is now made on the rubber bulb until the water in the tube is at its former level, when the column of mercury in the manometer will register the degrees of pressure made and correspondingly the ocular tension. M. B.

INSPECTION OF THE FUNDUS OF THE EYE IN TRANSMITTED LIGHT BY TRANSILLUMINATION OF THE ORBIT FROM THE NASOPHARYNX.—HERTZELL, C. (From the eye clinic of Prof. Silex, Berlin. *Berliner Klinische Wochenschrift,* 1908, No. 24, p. 1149.) The ophthalmodiaphanoscope is introduced into the mouth and gives a light of 50 candle power, the effect of which is increased by suitably arranged reflectors. The face, except the eyes, is covered by a black mask. The apparatus contains three lamps, between which the cooling water circulates. It uses $1\frac{1}{2}$ to 2 amperes and can be directly connected with a current of 110 volts. No special rheostat is required. It may be procured from Doerffel and Faerber, Berlin, Chausseestrasse 10.

An ophthalmoscopic view is obtained by direct inspection without other means; cases of ametropin necessitate correcting glasses for the observer.

The advantages are: 1. Simplification of the otherwise complicated technic of seeing by means of an apparatus. 2. Exclusion of the disturbing reflexes, as the light emanates from the interior of the eye. 3. Absolute darkness in the room. 4. Greatest extension of the visual field in the erect image, on account of the possibility of immediate approach to the eye.

The new method may help us to recognize certain diseases, especially of the walls of the globe and behind the orbit, for which the ophthalmoscopic examination is not sufficient. Hertzell succeeded by his method in focusing the inverted image of the transilluminated optic disc, by means of a lens, objectively visible, though indistinct, on a white screen, held before the eye.

The removal of the disturbing reflexes will make it especially valuable for the photography of the background. C. Z.

SPECTACLE FRAMES FOR INFANTS.—HARMAN, BISHOP, London (*Brit. Med. Journ.*, Sept. 12, 1908). Since spectacles are a regrettable necessity for infants in the treatment of squint, it becomes a problem how to fix these frames without injuring the delicate tissues of the infant face: hook temples do not answer, since, if heavy and strong, they produce abrasion, and if frail, they fail to retain the adjustment of the lenses. The writer uses the following expedient: A piece of tape, elastic or not, is looped under the nucha, its ends threaded through the eyes of the spectacle bows, then carried on to the vertex, where they are tied together. This circuit of tape holds the spectacles firmly in position, yet allows of sufficient elasticity to avoid pressure on the nose, and the bows are not dragged down on the tops of the ears.

C. H. M.

## LACRIMAL APPARATUS.

ON CONGENITAL FISTULA OF THE LACRIMAL SAC.—LOEHLEIN, WALTER (From the eye clinic of Prof. P. Roemer in the University of Greifswald. *Archiv fuer Augenheilkunde,* lxl. 2 and 3, 1908, p. 185), discusses the various theories of the genesis of the affection and reports three cases in children, aged 7. In each a piece of the fistula, 1.5 mm. long, was excised through a small oval incision of the skin, which was sewed with three sutures and healed promptly. From the microscopic examinations Loehlein concludes that the affection is non-inflammatory, but connected with a partial duplicity of the canal, as observed by Monesi, especially as the blind ending branch of the canal was generally situated below the tear sac and always on the outside of the canal. This branch may grow more intensely and be fused with the epithelium of the surface and thus remain open. C. Z.

HISTOLOGIC EXAMINATION OF THE ORBITAL LACRIMAL GLAND FROM AN OLD CASE OF TRACHOMA.—TRUC and PERETZ (*Revue Générale d'Ophtalmologie,* June 30, 1908). The specimen which the authors describe was taken from a case of long-standing chronic trachoma in which there existed facial paralysis and incurable epiphora. Removal of the gland brought about a cure. The histologic finding is given in full. B. E. F.

## LENS.

DEVELOPMENTAL DEFORMITIES OF THE CRYSTALLINE LENS.—COLLINS, E. TREACHER, London (*Ophthalmoscope,* August and September, 1908). The author's conclusions are as follows: To wait until a child is 10 months old before operating. At an earlier age the cornea is so small and the anterior chamber so shallow that the necessary instrumentation cannot be so satisfactorily carried out as in a more fully developed eye. Moreover, the amount of aqueous humor is so small that it does not suffice for solution of the liberated lens substance.

2. In some cases in which the pupil is small and does not dilate well with atropin it is best to commence with an iridectomy.

3. In nearly all cases it is well to begin with a needling, for valuable information can be obtained by this means as to the thickness of the capsule and consistency of the lens, even should it fail to liberate much lens matter to the action of the aqueous.

4. If the cataract is a dense, white, anterior polar one, set in a ring of clear, or partially clear, lens substance and apparently flattened from before backwards, the so-called disc-shaped cataract, then an attempt should be made to separate the central white opacity with a needle and let it fall into the anterior chamber. Two needles are sometimes required to effect this.

5. If, on pricking the capsule, milky-white fluid escapes into the anterior chamber (congenital Morgagnian cataract), it is well at once to evacuate this fluid, for fear of increased tension ensuing.

6. In some cases of congenital cataract, the whole lens and capsule can be removed in a most satisfactory way by forceps. Very often, however, such a procedure is followed by escape of vitreous. It is difficult to differentiate which cataracts can be safely dealt with in this manner. They generally seem to be complete cataracts with a tough capsule and lens matter of a gelatinous consistency.

7. If after a needling and some absorption of liberated lens matter, a dense, tough, white, fibrous-looking membrane remains, there is probably some atypical development of the anterior part of the vitreous. Under such circumstances an attempt had best be made forcibly to displace the membrane downwards and backwards out of the axis of vision. M. B.

## LIDS.

TWO ANOMALOUS WINKING CASES.—RHODES, J. N., Philadelphia (*Ophthalmic Record*, August, 1908). During the acts of winking of both patients the alæ nasi dilated. The compressor nasi muscles, while contracting, would throb and swell. No other facial muscles were involved. M. B.

ACCESSORY EYELID.—MATHEWSON, GEO. H. (*The Montreal Medical Journal*, October, 1908.) In October, 1904, a young lady, 21 years of age, consulted him in regard to a small tumor, situated at the inner angle of her left eye, between the margins of the eyelids.

On examination one saw that a small round tumor occupied the inner angle of the conjunctival sac of the left eye, completely hiding the caruncle. It was of the same color and consistency as the skin. By means of a probe it was found to spring from the upper lid, by a somewhat slender pedicle, at a point just to the nasal side of the lacrimal punctum, so that it was freely movable in all directions. The pedicle was cut through close to the margin of the upper lid by a couple of snips of a fine pair of scissors, and in a few days the cosmetic result was perfect.

The tumor measured three-sixteenths of an inch in diameter, and on histological examination proved to be of much the same nature as the eyelid. The epithelium which surrounded it was of the stratified pavement variety like that of the skin. The bulk of the tumor was composed of fibrous tissue and fat, with many large sebaceous glands and hair follicles. In some parts striated as well as non-striated muscle was found. F. A. and P. G.

ON TREATMENT OF INTENSE FORMS OF BLEPHARITIS-ECTROPIUM.—KUHNT, H., Bonn (*Zeitschrift fuer Augenheilkunde*, xx. 1908, p. 143), calls attention to the following points: Eversion of the lids by mechanical traction in consequence of scars and shrinkage of the skin, faulty position of the cilia—which, if the normal position of the lid is restored, must irritate the eye—elongation of the ciliary margin and atrophy of the orbicularis muscle at the ciliary margin. Therefore it is not sufficient to lift and replace the lid to its normal position, but the lower lid must be firmly fixated in its new position, so that forcible mechanical insults cannot alter it. Finally, the closure of the lids must be perfect. Kuhnt attained this in a number of cases by his method of operating, which is described in detail and must be read in the original. C. Z.

THE RATIONAL TREATMENT OF BLEPHARITIS.—BRAV, A., Philadelphia (*Therap. Gaz.*, August, 1908). In the squamous or seborrheic form, massage of the lids at bedtime with an ointment containing either yellow oxid, salicylic acid or tannic acid is recommended. The eyelid should be stroked gently for five minutes with the index finger carried horizontally from the inner to the outer angle of the palpebral fissure. In the pustular form hot applications are recommended. Diseased lashes should be removed and a 1 per cent. solution of silver nitrate applied to the lid margins. M. B.

Remarks on Proliferating Tarso-Conjunctivitis.—Gabrielides (*La Clinique Ophtalmologique,* June 25. 1908). This paper is practically a continuance of one published by the author in *La Clinique Ophtalmologique,* p. 28. of the current year. Gabrielides gives further microscopic findings and blood counts from later cases of this form of eye trouble. B. E. F.

## MATERIA MEDICA AND THERAPEUTICS.

Calmette's Ophthalmo-Reaction for Tuberculosis.—Weber, F. P., London (*Med. Press,* Aug. 12, 1908). got a negative reaction in 29 and positive reaction in 10 clinically non-tuberculous cases. In 30 positive cases the reaction was positive in 24 and negative in 6. The ophthalmo-reaction in its present stage is of only very limited diagnostic value. and may cause serious damage to the eye. A first instillation may be negative, and a decided reaction follow a second instillation a week or ten days later on. This may occur in perfectly healthy subjects. but has also been noted in advanced tuberculosis. The ophthalmo-reaction may be of value to determine whether a tuberculin preparation. introduced by the mouth or rectum. has been absorbed into the general circulation. In the latter case the conjunctiva on which the ophthalmo-reaction has been tried a week or two previously will become reddened just as it would were tuberculin to be injected underneath the skin. In both cases we have to deal with an auto-inoculation which reproduces the ophthalmo-reaction. or even lights up a chronic conjunctivitis. P. H. F.

The Status of the Ophthalmo-Reaction to Tuberculin.—Appleman, L. F.. Philadelphia (*Therap. Gaz.*. September, 1908). His conclusions are that the results of investigations as to the value of the ophthalmo-reaction are not yet considered final. although they are in the main favorable. In this country the difficulty in securing uniform results is in part due to the failure as yet to obtain a tuberculin which may be considered of standard. uniform strength. and until this has been done there must of necessity be more or less variability in the conclusions of various observers. M. B.

On the Value of the Ophthalmo-Reaction in the Diagnosis of Tuberculosis.—Gillies, Sinclair, Sydney (*The Aus-*

*tralian Med. Gazette,* May, 1908). In the observations recorded below either Calmette's serum was used or a serum made from old tuberculin practically identical with Calmette's. In all 129 tests were made in 103 individuals. Where any doubt could arise as to the correctness of the result, the test was controlled by the injection of old tuberculin. Forty such injections were given. Of the primary instillations 53 cases gave a positive and 50 a negative result.

Following the second instillation of tuberculin into the same eye it was seen that in eight cases where the second instillation was made before the eighth day no reaction occurred, while of four made on the ninth day three gave positive results, as did also cases where the instillation was repeated as late as the thirty-third day.

From these cases it appears that it is perfectly safe to repeat the test where any doubt exists, provided it be done within seven days of the first test. A positive result on repeating the instillation after nine days invariably occurs, whether the patient be tuberculous or not.

These results are explained on the assumption that a condition of anaphylaxis, that is, an increased sensitiveness of the tissues to tuberculin, is produced by the first instillation. The latent period, nine days, agrees with the latent period found in experimental production of anaphylaxis in animals. How long this condition of anaphylaxis lasts cannot at present be stated. At first it is marked, and accounts for the fact that a second instillation into an eye that has already reacted generally produces a much more marked reaction than the first, and for the fact noted later that where a confirmatory dose of tuberculin is given in a case that has reacted to the eye test, a fresh eye reaction occurs which is much more severe than the primary reaction.

As time goes on the anaphylactic reaction becomes less marked, but was well marked thirty-three days later, and was also noted in a tuberculous case where a tuberculin injection was given fifty-one days after the ophthalmo-reaction had been obtained.

From a practical point of view this fact is of greatest importance. It is absolutely necessary when this test is applied that the patient be clearly informed as to what has been done, otherwise repetition of the test in ignorance of the previous instillation must lead to serious mistakes in diagnosis.

Another point of practical importance is that disappearance of the reaction in a case of arrested tuberculosis means that not only has the tuberculous process ceased, but that sufficient time has elapsed for the tissues to lose the anaphylactic condition conferred by the disease when active. The length of this period between the cessation of active disease and the loss of anaphylactic reaction is as yet undetermined, but from the above observations is more than thirty-three days.

Recrudescence of eye reaction on injecting tuberculin.—They were surprised to find that in most of their early cases subcutaneous injection of tuberculin as a confirmatory test caused a recrudescence of the ophthalmo-reaction, while in a few it did not. Some of these secondary reactions were of great severity, much in excess of the primary reaction, going on in some cases to the production of conjunctival hemorrhages, and in one case, a child of 13, with tubercular hip, whose original reaction had been moderately severe, to phlyctenular ulceration of the cornea.

Further data are wanted on this point, but it seems probable that where the eye has not reacted to the instillation, injection should be performed within eight days to avoid an anaphylactic reaction. Where the eye has already reacted, confirmatory injection should be undertaken within five days or at a long period after, and should be of sufficient strength to insure reaction, and so obviate repeated injection and repeated recurrence of the eye reaction.

Many interesting questions suggested by the above experiments await answer. Among them, Is it possible by repeated instillation in a normal individual to sufficiently sensitize the body tissues generally to cause a positive reaction to a moderately larger injection of tuberculin? Is it possible by previous subcutaneous injection of tuberculin to sufficiently sensitize the eyes so that they will react to the eye test? Is it possible by injecting tuberculin to so sensitize the tissues of a healthy individual that an injection given after the anaphylactic latent period may give a positive reaction?

With the reserve that must always attach to a small series of cases they draw the following conclusions:

1. A positive ophthalmo-reaction where a 1 per cent. solution of Calmette's tuberculin is used, in the absence of secondary syphilis and possibly convalescent enteric fever, is diagnostic of the presence of an active or recently quiescent tubercular focus somewhere in the body.

2. A negative reaction does not definitely exclude tuberculosis, but is strongly against its presence, the margin of error being about 13 per cent.

3. The ophthalmo-reaction is as reliable as the ordinary tuberculin reaction, is readily carried out, involves little discomfort and no loss of working time to the patient.

4. The reaction is of no value unless it is certain that the eye has not been previously tested.

5. Where the original reaction has been negative it may be repeated within eight days and a positive result accepted.

6. Where doubt exists as to the correctness of the reaction, confirmatory injection, if done, should be performed within eight days where the reaction has been negative, and five where positive. F. A. and P. G.

THE CONJUNCTIVAL TUBERCULIN TEST.—MANNHEIMER, GEORGE, New York (*New York Med. Journ.*, Sept. 5, 1908). The writer criticises the term ophthalmo-reaction because it is half Greek, half Latin, and also because the reaction takes place in the conjunctiva and not in the eye; hence he claims this test ought to be called conjunctival test and conjunctival reaction. The originator of the test was not Calmette, but Wolff-Eisner of Berlin, who first employed and described it.

He described the technique in making the test. Speaking of the symptoms, he says they appear in from three to twelve hours in most cases, but may be delayed twenty-four to forty-eight hours. They are a scratchy feeling, lacrimation, redness and swelling of the inner canthus, then of the conjunctiva of the lower lid, which may increase and include the entire conjunctiva, with edema of the lids.

The reaction usually disappears within two, three or four days, but may last a week. Patients are usually not inconvenienced, some not even with third degree reactions. Others complain of pain in the eye and head.

He gives examples of occasional absorption of the tuberculin into the system. As contraindications he includes "any existing disease of the eyes, except errors of refraction, or any tendency thereto; or traces of previous disease; scrofulous children; hay fever; ordinary colds; perhaps also the administration of iodids." He believes that if we avoid cases in which such contraindications are present, no untoward effects will result.

He mentions the unpleasant sequelæ which have thus far been reported to show that the test is not harmless and also to prove that some of the sequelæ are preventable. He has made the test 350 times with no harm; the few severe reactions all passed off without mishap.

He concludes with the following general impressions: "The conjunctival test has fulfilled all reasonable expectations. It is beset with apparent discrepancies which we are yet unable to explain. It opens up many new and interesting questions. It will, of course, never take the place of a careful physical examination. It requires caution in its application and interpretation. It should be used judiciously so as not to bring it into discredit. It is important that we try to follow up our cases so that we may ultimately get an insight into the causes of the failures of the method." C. H. M.

ON THE SYMPTOMS AND THE COMPLICATIONS OF THE "OPHTHALMO-REACTION TO TUBERCULIN."—AUBINEAU (*Annales d'Oculistique,* July, 1908) concludes: 1. That the conjunctival reactions to the instillation of tuberculin present many forms and may be classed in four groups—slight, medium, intense and complicated or severe. 2. That the complications of the opthalmo-reaction are rare and generally slight when there are no recent or old lesions of the eye. A common conjunctivitis, however, does not contraindicate the use of the method. 3. That these complications are relatively frequent and often serious when the eye presents lesions either recent or old, and that the method should be absolutely rejected for eyes that present either tuberculous manifestations or affections, such as ulcero-vascular keratitis and the phlyctenular diseases of infancy, which may be more or less directly connected with tuberculosis.

Among the more serious complications are involvement of the iridochorioidal system, lesions of the bulbar conjunctiva similar to pustular ophthalmia or to the proliferations at the limbus of vernal conjunctivitis or to patches of episcleritis, a prolonged folliculitis or vegetations on the tarsal conjunctiva and ulcerations of the cornea followed by opacities.

There is a decided relation between the intensity of the reaction and the concentration of the solution of tuberculin used.

While all individuals with a history of ocular disease are subject to more frequent and more serious complications in ophthalmo-reaction, this is more decidedly the case with two kinds of ocular affections—the ocular affections of tuberculosis, and ulcero-vascular and phlyctenular keratitis. This, the author thinks, tends to confirm the view that there keratites are due to tuberculosis. G. C. H.

OCULAR LESIONS PRODUCED BY THE OPHTHALMO-REACTION.—ADAM (*La Clinique Ophtalmologique*, June 25, 1908). Since the publications of Wolff-Eisner and of Calmette the ophthalmo-reaction has been employed many times. Many authorities have claimed that the reaction is not absolutely sure, and that it can endanger the eye.

Adam states that when the eye is healthy the test produces a mild conjunctivitis, with sometimes the appearance of small hemorrhages. In scrofulous infants phlyctenulæ may occur. The cornea may take part in the reaction and keratitis follow. When the eye is diseased the ophthalmo-reaction becomes dangerous. B. E. F.

THE OPHTHALMO-TUBERCULIN TEST: TWO SEVERE REACTIONS.—MCKEE, HANFORD, Montreal (*The Montreal Medical Journal*, October, 1908). In a review of the already extensive literature of the ophthalmo-tuberculin test, one is struck with the difference of opinion expressed regarding its use and dangers. Described first as a test for tuberculosis by instilling a solution of tuberculin in the healthy conjunctival sac, its use has been considerably widened. Especially as a diagnostic measure in obscure ocular conditions the ophthalmo-reaction has been used extensively. That there have been serious results following the test cannot be denied, but whether those untoward results were the fault of the test or the way it was carried out remains to be seen.

The writer's experience has been wholly with cases with normal eyes. In over two hundred cases he met with only two where severe reactions were seen. One was a case of membranous conjunctivitis, the other a mucopurulent conjunctivitis followed by phlyctenular keratitis.

Case 1.—F. O., aged 4 years, osteomyelitis of the tibia, received a drop of 1 per cent. solution of tuberculin in the right eye on May 19 last. Twenty-four hours later there was a marked edema of the lids, the conjunctival surfaces of which were covered with a membrane, with purulent discharge. Continued bacteriological examination failed to reveal any pathogenic organisms. This fact helped to relieve our anxiety in spite of the severe clinical condition of the eye. The eye remained in this condition for ten days. On May 29 cold compresses were applied and the eye began to improve rapidly. Three days later the eye was quite well. The reaction here, as may be judged, was a very severe one and for some days gave a great deal of anxiety.

Case II.—M. L., aged 16 years, tuberculous hip, received on May 14 last a drop of 1 per cent. tuberculin solution in the right eye. Very slight injection of the palpebral conjunctiva followed. One week later the test was applied to the left eye. The day following there was a well-marked reaction, which twenty-four hours later had increased, with a mucopurulent discharge.

At the end of one week there was still a profuse mucopurulent discharge, which began now to lessen. Three days later there was noticed at the corneosclerotic margin a well-marked phlyctenule.

Under the ordinary treatment the conjunctivitis cleared up and the phlyctenule disappeared, so that on June 18, three weeks after the instillation of the tuberculin, the eye was quite well.

The results of the ophthalmo-tuberculin test, on the whole, are as yet contradictory. Nevertheless, in the normal conjunctival sac in adults uniformly satisfactory results, from a diagnostic point of view, may be obtained. With caution the severe conjunctival inflammations may be eliminated, and then the practical value of the test will be assured. On the other hand, Wolff-Eisner's suggestion as to the strength of the solution, 1 to 100,000, to be instilled in an eye where tuberculosis of the eye is suspected needs to be heeded. It seems, too, pretty well established that the test should not be applied in an eye involved in any process of disease, with a 0.5 or 1 per cent. solution, because of the dangers of excessive reaction likely to follow. F. A. and P. G.

Evil Consequences of Calmette's Reaction and Their Prevention.—Seligmann, S., Hamburg (*Zeitschrift fuer Augenheilkunde*, xx, 1908, p. 130). A drop of the original Calmette's solution (0.5 per cent.) was instilled into the left eye of a girl, aged 20. After four hours the eye became red and painful, commenced to weep and suppurate and, towards evening, the condition grew worse. Seven days later she came to Seligmann, who found the palpebral conjunctiva very much injected and swollen, discharging viscid, yellow pus, and three large phlyctenæ at the medial corneal margin, with very marked ciliary injection. Here and at the semi-lunar fold a large number of small light, or opaque yellowish, partly prominent nodules were imbedded. Under atropin and cold applications the pain and suppuration soon subsided.

On account of a new hemoptoë the patient did not return until about a month later. The large phlyctenæ had disappeared, but the whole periphery of the cornea was dotted with miliary nodules to which blood vessels radiated from all sides. The whole ocular conjunctiva was covered with miliary yellowish nodules, and under the epithelium of the cornea white punctiform infiltrations were noticeable.

The suppuration was merely toxic, as the pus was almost free from microbes. Also, the pus cells differed from those in ordinary acute conjunctivitis. Their changes apparently were caused by the tuberculin. This toxic action of tuberculin on the living pus cells of the conjunctival secretion arouses especial interest, as it could still be ascertained eight days after the instillation. The tuberculin probably retained its action at least eight days and perhaps for three to four weeks, as Seligmann assumes from the sudden aggravation and spreading of the ocular affection, which he observed such a long time after instillation.

While phlyctenæ have been repeatedly seen after conjunctival or cutaneous Pirquet's reaction, though chiefly in children, the miliary nodules seemed to be an entirely novel form of eye disease. Microscopically they consisted of subconjunctival circumscribed round cell infiltrations with necrosis and giant cells, but no tubercle bacilli. An intraperitoneal inoculation of a guinea pig with an excised nodule was negative. Therefore Seligmann concludes that they were produced by the dead bodies of bacilli or their endotoxins. Most likely the patient formerly had a scrofulous inflammation of the eye. The maximal hypersensitiveness of scrofulous children with regard to toxins of tubercle bacilli is well known, but it is not known that this hypersensitiveness may persist for years when nothing is noticeable of scrofulous inflammation.

The treatment consisted in irrigations of the eye with water, to remove mechanically the remnants of tuberculin, and soon afterwards with 1 and 2 per cent. solutions of glycerin, which, according to Koch, is the best means of extracting tubercle bacilli. It relieved the symptoms very rapidly. Seligmann therefore recommends it, not only as a therapeutic, but also as a prophylactic remedy in all tuberculin instillations into the eye, immediately after the reaction sets in, to avoid future serious symptoms. Those cases in which, after ophthalmo-reaction of one eye, redness of the other eye was observed, are most likely caused by manual transmission, not, as Wolff-Eisner pointed out, through circulation or sympathetic irritation of the ciliary nerves. As this danger is greater in abundant suppuration, protection of the other eye by a bandage is indicated. C. Z.

THE DANGERS OF CALMETTE'S OPHTHALMO-REACTION.—BUTLER, T. HARRISON, Coventry, Eng. (*Brit. Med. Journ.*, Aug. 8, 1908.) The writer alludes to his previous paper on this subject (*Brit. Med. Journ.*, May, 1908), in which he had formed the conclusion that the reaction, though sometimes obtained in the non-tuberculous, and sometimes not obtained in the certainly tuberculous, was a useful aid to diagnosis, and that if the eye used for the test was healthy there was no danger to be feared from a 0.5 or a 1 per cent. solution of tuberculin. Three of the cases quoted in the paper have since done so badly that he has changed his opinion and now believes that the dangers are very real, and that, since the reaction is by no means conclusive, it is hardly a justifiable method of diagnosis.

In the first case reported, a typically tuberculous process was set up in a perfectly healthy eye as a result of the instillation of tuberculin; a central corneal nebula will permanently reduce considerably the acuteness of vision.

In the second example, although there was no complication of the cornea, a violent reaction was followed by chronic conjunctivitis with much thickening and a very chronic phlyctenule.

In the third patient a very violent muco-purulent conjunctivitis occurred and resisted all treatment for two months. In none of these three cases was there pre-existing eye disease.

C. H. M.

THE PRESENT STATUS OF PNEUMOCOCCUS SERUM THERAPY OF SERPENT ULCER.—ROEMER, PAUL, Greifswald (*Deutsche Medizinische Wochenschrift*, 1908, No. 34, p. 1465), defends the value of his serum against the criticisms of A. von Hippel, who reported on this therapeutic experience with Deutschmann's serum (reviewed in this number of OPHTHALMOLOGY). Roemer maintains that Deutchmann's serum as a non-specific cannot influence any stock of pneumococci in the body of animals, nor save the animals from infection and death, while Roemer's serum is adjusted for a greater number of stocks, and a small drop of it suffices to protect animals against multifold fatal doses. Roemer then describes his modus operandi with his serum in his clinic and the great immunizing value of his serum. C. Z.

OCULAR TUBERCULOSIS, A CONTRIBUTION TO THE STUDY OF THE TREATMENT BY TUBERCULIN.—KROEMER (*La Clinique Ophthalmologique*, June 10, 1908.) The writer states that oculists have the advantage of other physicians in being able to see the effects of their therapeutics, and are thus able to prove the value of tuberculin. In general the treatment by tuberculin is too quickly abandoned. The author cites a case, that of a young girl aged 18 years, who had been under treatment since her fifth year; no tubercular antecedents; condition extremely bad when brought to Kroemer; pupil of right eye was irregularly dilated; there were posterior synechiæ. At apex of left lung a little dullness; temperature elevated every evening. Patient was given three series of tuberculin injections at intervals and cured. B. E. F.

THE DIAGNOSTIC AND THERAPEUTIC VALUE OF TUBERCULIN IN TUBERCULOUS EYE DISEASES. — TÖRÖK, E., New York (*Arch. Ophthal.*, New York, September, 1908, xxxvii, 531), states that many of the unfavorable results that have followed the use of tuberculin have been due to the administration of too large doses, and that for that reason it has not been more generally used during the last few years. He believes that tuberculin, carefully dosed and applied in minimal quantities, is an excellent and in many cases an indispensible remedy. The author agrees with Reuchlin that if a patient, with a suspicious inflammation of the eyes, reacts in the typical manner to small quantities of old tuberculin the existence of active tuberculosis is proven, and adds that all the cases he has treated and which reacted to tuberculin proved to be cases of tuberculosis and were completely cured after treatment with Tuberculin R. Török uses, for diagnosis, Koch's old tuberculin (T. V.) diluted with 0.25 per cent. phenol solution. For therapeutic purposes he uses new tuberculin (T. R.), commencing with 1/500 mg. and gradually increasing to 1 mg., and has had no bad after-effects.

The author has treated 21 cases of ocular tuberculosis and obtained satisfactory results in all but two cases. He gives the clinical histories and results of treatment in five cases. W. R. M.

THE INCREASING IMPORTANCE OF TUBERCULOSIS AS A CAUSE OF OCULAR DISEASE. THE NEWER METHODS OF DIAGNOSIS AND THE TREATMENT.—DERBY, GEO. S., Boston (*Arch. Ophthal.*, New York, September, 1908, xxxvii, 515), gives the results of his observations in the use of the new tuberculin tests and on the diagnosis and treatment of tuberculosis of the eye.

He calls attention to the necessity of a more careful consideration of tuberculosis as an etiological factor in eye diseases, and refers to the investigations of Stock, who was able to produce in rabbits, uveitis scleritis, sclero-keratitis, nodules in the conjunctiva and swellings in the lids by injecting tubercle bacilli into the blood. He refers to the ophthalmo-reaction of Wolff-Eisner and Calmette and to the cutaneous reaction of von Pirquet, calling attention to the many unsolved problems connected with these reactions, such as their relative delicacy, their relationship to each other and to the subcutaneous test and the meaning of the various types of reactions which occur.

The author reports his results in 103 cases. Of these 83 reacted positively, 18 negative and 2 doubtful. The conjunctival test was made 61 times; 45 positive, 14 negative and 2 doubtful. The cutaneous test was made 58 times; 52 positive, 4 negative, 2 doubtful. Both tests were made on 16 patients, and on 14 both were positive. Of the cases that were thought to be tubercular, there were 43 cases of phlyctenular disease, of which 88 per cent. gave a positive reaction; 16 cases of relapsing sclero-keratitis, all positive, 100 per cent.; 16 cases of scleritis, 81 per cent. positive; 9 cases of uveitis, all reacted positively; 3 cases of interstitial keratitis, 2 positive; 4 cases showing vitreous opacities and cloudiness in the lens, 1 was positive, 2 negative, 1 doubtful. A case of tuberculosis of the conjunctiva gave a positive reaction. In 4 cases reaction did not occur until after 48 hours. In these cases the patients appeared to be in good general condition, and Wolff-Eisner believes this to be the reaction of the clinically healthy who have an encapsulated focus. In several cases the conjunctival reactions were severe. In the author's experience the cutaneous reaction has been more sensitive than the conjunctival, and has shown no untoward results. Wolff-Eisner believes that a positive conjunctival reaction points to active tuberculosis, while the cutaneous tests may appear when there is a healed lesion.

The author believes that the present weight of evidence tends to prove that the cutaneous test is specific and of great value. Darby's investigations point strongly to a tubercular origin in his cases of phlyctenular disease: out of 19 cases 16 showed evidences of tuberculosis on physical examination. W. R. M.

DIAGNOSIS AND TREATMENT OF TUBERCULOUS IRITIS.—D'ALLESSANDRO, Naples (*Die Ophth. Kl.*, June 20, 1908). The following conclusions are drawn by the author from an interesting case of tuberculous iritis occurring in a 13-year-old child: Tuberculin, while an aid to diagnosis, is at the same time an active curative agent in tuberculous diseases of the eyes; that among the various preparations so far presented tuberculin T.R. is to be preferred, as it is well borne and is harmless; that tuberculin must be given in very small doses; that to secure entirely satisfactory results the tuberculin must be injected from the beginning of the disease; that with tuberculin injections enucleation may be avoided when seemingly strongly indicated; finally that inasmuch as tuberculin increases bodily resistance, certainly more then any other means, removes the predisposition to the disease. W. Z.

CONTRIBUTION TO SERUM THERAPY IN DISEASES OF THE EYE. —VON HIPPEL, A., Goettingen (*Deutsche Medizinische Wochenschrift,* 1908, No. 27, p. 1182), treated 40 patients with Deutschmann's serum (*Deutschmann's Beitraege zur Augenheilkunde,* Heft 69) with the following results: The serum is very much recommended in severe plastic iritis and in serpent ulcer, in which the galvanocautery may be dispensed with, if the serum is injected frequently enough and in the required strength. It is useful in serous non-tuberculous iritis, but not in severe infections of the vitreous. Here early and energetic inunctions are recommended with perhaps simultaneous injections of serum. A sufficient explanation of the action of this serum is still lacking.

C. Z.

SERUM-THERAPY IN RELATION TO DISEASES OF THE EYE.—AXENFELD, PROF., Freiburg, Germany (*Brit. Med. Journ.,* Sept. 12, 1908). The writer warned against over-sanguine expectations which eventually lead to undue scepticism. He reviewed the present state of our knowledge of this subject:

In obstinate cases of blepharitis and hordeola the subcutaneous application of staphylococcus vaccine might prove useful. The healing action of Behring's antitoxic diphtheritic serum on the conjunctivitis produced by Loeffler's bacilli was so well established by experimental and clinical observations that it was unnecessary to dwell upon it. He thought the pollantin serum of Dunbar good in some cases of hay fever, but not in all, and the result was never permanent. The jequiritol serum of Roemer, which was employed to arrest the violent action of jequiritol when used in cases of pannus from trachoma, etc., prevented the necrosis from too violent reaction, but was not always successful.

With regard to serum therapy against the pneumococcus, that hitherto prepared by Roemer and Merk, he did not consider fulfilled the high therapeutic requirements necessary for the treatment of ulcus serpens. It possessed some curative properties, but did not act so certainly that it could take the place of surgical treatment altogether. It could only be employed in benign cases when conservative treatment was justifiable, or in which other treatment was incapable of arresting the destruction of the cornea. von Hippel's tuberculin treatment had, in a large number of cases of tuberculosis of the eyeball, caused a complete cure. Wright and others had asserted that the injections of large doses as recommended by von Hippel had done more harm than good, so that ophthalmologists required a special series of researches to decide the question of dosage. Professor Axenfeld said he was still experimenting, but his own experience was so far rather in favor of von Hippel's method than the other. He had found that extremely chronic cases of tuberculous irido-chorioiditis were influenced in but a very small degree by the tuberculin treatment.

Darier and Deutschmann had asserted that as good or better results were to be obtained by the use of non-specific serums, such as that prepared from diphtheria, tetanus and yeast, against *all* kinds of infection, and to such the term "polyvalent serum" was applied. He did not think that the non-specific serums held out anything like such a good prospect of success in definite cases as the specific serums, and he believed much experimental evidence to be necessary before the results of Darier and Deutchmann could be accepted.

As regards the technique of serum treatment, as a rule it was more efficient when injected subcutaneously than when applied locally to the part. Subconjunctival injections of serum were not much to be recommended, while the subconjunctival injection of vaccines, that is, dead bacteria, was irrational, as before it could produce any healing effect it would have to produce antibodies from the spleen, bone marrow, etc., and applied directly to the eye it would only act as an irritant, and thus increase the local affection. C. H. M.

A Case of Rupture of the Internal Carotid in the Cavernous Sinus, Treated by Injections of Gelatinized Serum. —Carlotti (*Annales d'Oculistique,* June, 1908). The case occurred in the service of Morax. The patient had extensive exophthalmos and decided bruit without pulsation, palpebral edema and chemosis, resulting from fracture of the base of the cranium.

Under treatment by gelatinized serum the bruit, chemosis and edema disappeared, but the exophthalmos was not much reduced. G. C. H.

On the Action of Roentgen Rays on the Human Eye.—Birch-Hirschfeld, A. (From the eye clinic of Prof. H. Sattler in the University of Leipzig. *Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 11, 1908, p. 129.) A man, aged 64, was treated for 30 minutes, with intense radiation with Roentgen rays, on account of a chancroid of the temporal angle of the lids of his left eye. At the examination, forty days later, the patient stated that two weeks after the radiation the eye became very much inflamed and painful. The cilia at the temporal halves of the upper and lower lids were completely missing, and the temporal portion of the cornea was infiltrated. Two and a half years later the posterior cortex of the lens showed a cloudy opacity which progressed and involved the whole lens after one and a half years. At that time the examination with Zeiss' binocular lamp revealed peculiar changes of the blood vessels at the temporal sector of the ocular conjunctiva, viz., numerous constrictions and sacciform ectasiæ. Near the corneal limbus was a yellowish soft infiltration like a pinguecula covering the vessels, while the corresponding portion of the cornea exhibited an opacity like a gerontoxon. The cataract was uneventfully extracted.

Birch-Hirschfeld attributes the macroscopic changes of the blood vessels to vacuolizing degeneration of the intima, as observed as consequence of exposure to Roentgen rays by Gassmann, Halkin, Freund and the author himself, although the anatomical proof was lacking in this case. Through the thickening of the intima, the swelling and detachment of the endothelia, an obstacle to the blood current is created impeding the outflow from the veins, which leads to an ectasia before the stenosed portions. This ectasia will develop the more readily as the muscular and elastic coats participate in the pathologic process.

The elapse of several years for the development of these vascular changes is not unusual and corresponds with the experimental data. The primary opacity of the cornea was due to interstitial keratitis, caused by the Roentgen rays, and may completely disappear while the later permanent opacity of the cornea and the gerontoxon were secondary and due to the vascular changes of the ocular conjunctiva. Whether the cataract was caused by the Roentgen rays is not certain, but the fact that it developed later and progressed more rapidly than the senile cataract on the other eye suggests a possible causal connection. C. Z.

ARTIFICIAL HYPEREMIA IN OPHTHALMOLOGY.—HESSE (*Allgemeine Wiener Medizinische,* May 19, 1908). The author recommends this method of treatment in phlegmous furuncles of the lids, hordeolum, blepharitis, dacryocystitis, blennorrhea sacci lacrimalis, conjunctivitis trachomata, keratitis parenchymatosa and in most cases of ulcers of the cornea. J. G.

SOPHOL IN OPHTHALMOLOGY.—BOCK, EMIL (*Wiener Medizinische Wochenschrift,* July 4, 1908). Sophol is a combination of silver with formaldehyd nucleic acid. It is used in affections of the conjunctiva, accompanied with copious secretions.

It is a mild non-irritating bactericidal remedy, which does not penetrate into the deeper tissues; it is employed in 5 to 10 per cent. solution.

The drug may also be employed by sprinkling it into the conjunctival sac. It proved efficacious in purulent conjunctivitis and blennorrhea neonatorum. J. G.

ARSENIC IN THE TREATMENT OF SYPHILIS.—SALMON (*La Clinique Ophthalmologique,* April 25, 1908). The author's paper, which, if quite a long one, discusses the value of arsenic, more especially the atoxyle form of it, in syphilis. Basing the fact of Koch's success with the cure of the sleeping sickness, and of others in removing the various spirillæ from the system by arsenic, Salmon claims that the spirochætæ are rapidly removed from the body by the anil-arsenate atoxyl. Salmon believes that cases of syphilis in which the drug has been unsuccessfully employed, insufficient doses have been given, and that doses of 50 centigrams are needed, the repetition of this quantity to depend on clinical conditions.

It should be remembered that reports have been published of optic nerve atrophy caused by the atoxyl treatment: but Darier claimed with the use of the French preparation of the drug, no optic nerve trouble has followed. B. E. F.

THE VALUE OF MORPHIN DERIVATIVES IN OCULAR THERAPEUTICS.—FOX, L. WEBSTER, Philadelphia (*Ophthalmic Record,* August, 1908). Of the various derivatives of morphin, dionin is the only one which has proven of value in ophthalmic practice. The chemosis so characteristic of the local use of the drug is only produced by solutions above 2 per cent. in strength. The author has found subconjunctival injections of 1 per cent. and 2 per cent. solutions to give better and quicker results than topical applications; this is especially true in interstitial keratitis. He does not find it of much value in old corneal opacities, retinal detachment, and in promoting absorption of soft lens matter after needling. He has found it of value in promoting absorption of recent corneal opacities and recent vitreous opacities. It is of great value when combined with atropin in painful acute iritis and iridocyclitis. M. B.

Thyroid Extract in Keratitis.—Radcliffe, McC., Philadelphia (*Ophthalmoscope,* September, 1908). Two cases are reported of interstitial keratitis. One was a young man aged 23, and the other a boy of 11. Both eyes involved in each case. The usual methods of treatment resulted in no improvement after several months' trial. The patients were then placed upon thyroid extract internally and a 3 per cent. solution of this drug instilled in the eyes three times daily. The results of this treatment were prompt and very striking, complete clearing of the corneæ taking place. The thyroid extract was given in 5 grain doses three times daily. The author believes that doses of from 1 to 2 grains will be equally affective. M. B.

Value of Sweating in the Treatment of Internal Affections of the Eye.—Hansell, Howard F., in the *Pennsylvania Medical Journal* (Abst., *Jour. A. M. A.,* Oct. 31, 1908), August, 1908, describes diaphoresis in serious eye affections. It seems true that sweating is not resorted to with sufficient frequency in edemas, congestions and inflammations of the eye.

The methods most used to cause diaphoresis are by the administration of jaborandi (pilocarpin) and by dry heat. Owing to the fact that jaborandi occasionally produces considerable weakness, Hansell has abandoned its use, and now causes sweating by first covering the mattress of the bed on which the patient is to lie with a rubber sheet. The patient is then enveloped in three thick blankets. "On each side, extending from the feet to the shoulders, and as close to the skin as the heat will permit are placed receptacles filled with hot water." The patient is then given a cup of hot fluid, preferably tea.

The sweating should begin very quickly, and should continue, provided the hot water applications are kept up. If a glass of ice water is given a half hour after the sweating has commenced, the sweat glands are stimulated to increase their work. All during the sweating process the head should be either wrapped with a wet towel or an ice cap should be applied. Hansell makes the outside limit of this sweating process an hour and a half. Of course the duration of the sweating could be limited, if at any time there was faintness or prostration. After the sweating the body should be dried and rubbed with alcohol and the patient removed to a dry, warmed bed and allowed to remain there for several hours.

It is preferable that this sweating process should be accomplished in the afternoon, the patient remaining in bed until the following morning. The number and frequency of the sweatings depend on the severity and chronicity of the disease and on the physical condition of the patient. The reaction of the patient to the treatment and the effect on the eye inflammation, for which it is instituted, will determine the frequency of the sweatings and the length of time each should be allowed to continue.

At the conclusion of the sweat bath the patient's temperature may have risen to 102 or 103° F., and the pulse is accelerated, but in healthy reaction the temperature should have returned to normal two or three hours later. If the reaction is such as to produce a subnormal temperature, the duration of the sweat should be shortened, and should perhaps be preceded by the hypodermatic administration of strychnin or other stimulant. If the temperature remains high longer than two or three hours the sweat baths should not be continued.

de Schweinitz believes that in spite of the disadvantages of jaborandi, in some cases no other kind of sweat will do as much good to the local eye condition as will this drug.

The advantages of these sweatings seem to be due to the stimulation and increased activity of the lymphatic system, and this absorbent activity of the lymph, and possibly blood vessel systems, tends to clear up or relieve exudates and inflammations of the eye.

The special indications for the use of these sweatings are "inflammation of the sclero-cornea, of the uveal coat, acute and chronic, of the chorio-retina, and of the optic nerve." While this diaphoretic treatment is not always successful, Hansell has never known it to do harm. It is of greatest value in chronic inflammations associated with exudates into the different parts of the eye. Of course when atrophy or connective tissue change has taken place in any part of the eye, sweatings could do no good, but Hansell says that it cannot always be decided positively from the ophthalmoscopic findings that an exudate has given place to connective tissue, and for this reason it is many times wise to try the efficiency of diaphoresis.

Of course such treatment does not preclude the coincident administration of salicylates when rheumatism is the cause of the eye inflammation, or of mercury or iodids when syphilis is the cause of the trouble.

Diaphoresis, perhaps best with pilocarpin (jaborandi) should be tried in opacities of the vitreous, and in alcohol and tobacco amblyopia, of course after the withdrawal of these causative agents. Patients suffering with loss of sight due to alcohol or tobacco should also, of course, be given strychnin. H. V. W.

THE THERAPEUTIC EMPLOYMENT OF SUBCONJUNCTIVAL INJECTIONS OF AIR.—CHESNEAU (*Annales d'Oculistique,* May, 1908), has found subconjunctival injections of air useful in phlyctenular ophthalmia, when the cornea is involved, band keratitis, scrofulous and granular pannus, marginal and central ulcers of the cornea, tubercular parenchymatous keratitis, herpes of the cornea, recurrent keralgia following superficial erosion of the cornea, etc.
G. C. H.

THE IMPORTANCE OF THE ANESTHETICS FOR THE TREATMENT OF CORNEAL OPACITIES PRODUCED BY CAUSTICS.—GUILLERY, H., Coeln. (From the Bacteriological Laboratory of the City of Coeln. *Archiv fuer Augenheilkunde,* lxi, 1, 1908, p. 38.) The deleterious action on the epithelium of the cornea, common to all local anesthetics, is most likely to be ascribed to their common anesthetizing, i. e., neuroparalytic, properties. In close connection with the damage to the epithelium by the anesthetics, is their quality to accelerate the diffusion of soluble substances from the conjunctival sac into and through the cornea. This is most welcome and an essential aid in the treatment of corneal opacities caused by caustics, allowing the entrance of the clearing solutions, which otherwise is barred by the intact epithelium. In order to perfect and shorten the time of the treatment of opacities from cauterization, Guillery searched for an anesthetic which, free from other disturbing effects, is best adapted to remove the resistance of the intact surface against the penetration of liquids from the conjunctival sac. He therefore tested, besides cocain, the most common anesthetics in that regard, especially those which leave pupil and accommodation uninfluenced, in the following manner: The anesthetic was instilled every five minutes into one eye of a rabbit for an hour. In the second half hour a saturated solution of nitrate or acetate of lead was dropped into both eyes (the second eye for comparison), two to three minutes after each instillation of the anesthetic into the first eye, i. e., about six to eight times. After the experiment was finished the animal was killed and both corneæ hardened in formalin and alcohol and cut (in paraffin) in continuous series of from 20 to 25 micromillimeters. The presence of lead was proved by ammonium sulphid.

which gives a brown color, and by hematoxylin with alum. the changes of the epithelium by staining with eosin and hematoxylin, or according to von Gieson.

From his numerous very careful and exact experiments Guillery concludes that there are marked and considerable differences in the action of the various anesthetics on diffusion, illustrated by the following series, arranged according to decreasing intensities: Holocain, alypin, eucain, cocain, tropacocain, stovain, novocain. Holocain was used in 2 per cent., all the others in 5 per cent. solutions. They show the danger of applications of solutions of lead simultaneously with anesthetics. The lesion of the epithelium is the essential feature for the entrance of solutions of lead. The blood vessels can have no determining influence, since the same effects are observed, when the vessels are influenced in an opposite sense, or different effects under the same vascular conditions. Two plats illustrate the contents of lead in the corneal sections and the changes of the epithelium. C. Z.

GLYCERIN AS AN ADJUVANT TO SILVER NITRATE.—HARMAN, BISHOP, London (*Brit. Med. Journ.*, Sept. 12, 1908). The writer comments on the numerous albuminoid preparations of silver now on the market and in vogue principally because they cause less pain than the nitrate. After experimenting he found a formula which reduced the pain caused by nitrate of silver. He adds 15 per cent. of pure glycerin to a 0.5, 1 or 2 per cent. solution of silver nitrate in distilled water. This raises the specific gravity of the pigment and increases its penetrative action on account of the hygroscopic powers of glycerin. He has used this preparation on a large number of patients, and finds it distinctly less painful than the ordinary solution of nitrate of silver, and rather more effective. The salt does not lose in caustic action, since a fine pellicle of destroyed epithelium can be seen, but the pain is reduced by the action being spread over a longer period.
C. H. M.

THE VALUE OF BLISTERING IN EYE DISEASES.—WEITLAUER, Ottental (*Wochensch. f. Therap. u. Hyg. d. Aug.*, Oct. 15, 1908), believing that the presumption is in favor of phlyctenular disease, and pannus to be scrofulous (tuberculous) in origin was led to use counterirritation in their treatment in the form of empl. canth. perpetuum spread upon linen in front of the ear and over the temples. It was allowed to remain on one or four or five days, and zinc paste was then applied. It was painless and produced a bleb, in the course of five hours serious weeping from the underlying stratum mucosa caused the outpouring of leucocytes. This was the whole process. The plaster may be weakened with diachy. ointment. The treatment was successful where other methods had failed, but was found to be of no value in other forms of conjunctivitis, keratitis or iritis. W. Z.

THE INSTILLATION OF EYE-DROPS AND A METHOD FOR LESSENING THE DANGERS IN THE OPHTHALMO-REACTION TESTS.—HANS. H. (*Die Ophth. Kl.*, May 20 and June 5, 1908), believes that attention to detail in the method of instilling drops adds greatly to their efficiency and lessens their discomfort to the patient. He recommends that the head be thrown backward and that in instilling into the right eye to avoid the cornea the gaze be directed to the right and the head inclined to the left. This is the best position for the ophthalmo-reaction, as it keeps the solution from the cornea and allows it to be brought in contact with the place where the typical reaction is expected, that is, the vicinity of the caruncle. When the cornea is especially to be reached the head is inclined to the right and the gaze is directed downwards. In general it is best to stand behind the patient so that the head may rest upon the surgeon's chest. The lids are separated by placing the index finger on the brow and the second finger on the inferior orbital margin. This has the advantage of not only separating the lids but also of everting the punctum. In the ophthalmo-reaction he has found that if the excess is absorbed with dry cotton it in no way interferes with its success, while at the same time it spares the cornea.

Where the constitutional action of the anesthetic is to be feared the author has obtained good results by applying a tuft of absorbent cotton saturated with the solution to the field of operation. W. Z.

## MISCELLANEOUS.

EUROPEAN EYE CLINICS.—WOLFENSTEIN, LEO, Cleveland (*The Cleveland Medical Jounal*, October, 1908), believes that the American clinics in the east furnish better opportunities for practical work in ophthalmology than the European, but that along strictly scientific lines the latter are superior. In Vienna, the Mecca of American physicians coming to Europe to study, an American medical association is of much assistance to those not proficient in the German language. The opportunities of the American physician are good. The methods used and advantages in Jaeger's and Fuch's clinics are described, and other Vienna clinics mentioned. The clinics of other noted men in other German cities, as Uhthoff, Eversbusch, Axenfeld, etc., are briefly considered. Berlin does not compare well with Vienna for obtaining instruction in ophthalmology. The clinic at the Royal London Ophthalmic Hospital is described and other ophthalmic hospitals mentioned. M. D. S.

THE EYES OF PLANTS.—(*Scientific American*, Oct. 17, 1908.) Dr. D. T. Macdougal, Mr. Harold Wager and Prof. Haberlandt are quoted on the subject of the sensitiveness of plants to light. The upper and lower surfaces of leaves are covered by a thin transparent skin, which can, in many cases, be very easily peeled off. When examined under the microscope this skin is seen to consist of innumerable compartments or cells, many thousands of which are found on a single leaf. They contain a clear watery sap, and their shape is such that they behave like ordinary convex or plano-convex lenses, the rays of light which fall upon them being converged and brought to a focus in the substance of the leaf. These cells probably enable the plant to perceive the difference between light and dark, and set up a stimulus which results in the movement of the leaf into such a position that it can obtain the maximum amount of light: or it may be that they serve for the more efficient illumination of the green grains within the leaf upon which the effective food-supply of the plant depends. Possibly both play some part in aiding the leaf to perform its work more efficiently. These cells are found in practically all plants. In many cases these lens-cells may be compared with the corneal facets of an insect's eye, so far as their general appearance and power of causing a convergence of light are concerned. M. D. S.

THE HARMFUL EFFECTS OF ULTRA-VIOLET RAYS ON THE HUMAN EYE.—(*Scientific American*, Oct. 24, 1908.) Investigations carried out by Schanz and Stockhausen show that *ophthalmia electrica* is due to ultra-violet rays. The same disease, though in a less characteristic form, is produced also by many other illuminants containing a large percentage of ultra-violet rays. Snow blindness is similar in its symptoms to electrical ophthalmia, and is likewise produced by ultra-violet rays contained in reflected sunlight. That the action of ultra-violet rays, so far from being confined to the external eye, also affects its deeper parts, is evidenced by the intense fluorescence of the lens which they are able to produce. As a slight turbidness is produced in the lens by an intense lighting with ultra-violet rays, it may be said that the cataract of old age is possibly due to a progressive alteration of the lens. The spectrum of crude oil lamps and candles hardly exceeds the region of visible rays. The ultra-violet rays, however, extends as soon as a chimney is added and an even more extensive spectrum is produced by using an incandescent mantle; but the longest ultra-violet spectra are found in electric illuminants. In all electric lamps fitted with a glass cover of any kind, the short wave lengths are absorbed by the glass. Protective spectacles afford no protection against ultra-violet rays, and weaken the whole spectrum, for which reason they are not suitable for practical purposes. The authors have undertaken the production of a new kind of protective glass which is now brought on the market under the name of "euphos" glass. This glass, which is of a light greenish-yellow hue, owes its remarkable power of absorbing ultra-violet rays to its special composition rather than to its color. The composition can be adapted to each kind of lamp. With a very slight loss of light (3 to 5 per cent.) this glass screens off entirely any ultra-violet rays. Special experiments made on animals show that it really affords an efficient protection to the eye. M. D. S.

CONSANGUINITY A CAUSE OF CONGENITAL NYSTAGMUS.—DUDLEY, W. H., Los Angeles (*Arch. Ophthal.*, New York, September, 1908, xxxvii, 565), gives a table showing the number of cases of nystagmus occurring in four generations of a family in which there had been numerous intermarriages.

On both the paternal and maternal sides, in the four generations, there were forty-seven individuals of whom twenty-six were nystagmic. On the father's side there were thirty, of whom sixteen were nystagmic, and on the mother's side there were seventeen, of whom ten were nystagmic. W. R. M.

MONOCULAR DIPLOPIA. ITS RELATIONS TO HYSTERIA.—CHARLES, J. W., St. Louis, Mo. (*Amer. Jour. Ophthalmology*, April, 1908). The writer states that observers have been almost unanimous in the opinion that hysterical unilateral diplopia, polyopia, micropsia (the "megalo-micropsia" of Parinaud) are due to a peculiar kind of spasm of accommodation whereby the lens is fixed in its curvature, focusing at only one distance, and thereby destroying the amplitude of accommodation, which is left intact in the ordinary spasms of accommodation seen in otherwise normal individuals. He cites numerous authorities who support this theory. He shows, however, that all cases of this anonaly cannot be explained in this manner, and speaks of other causes, reviewing these in his conclusions and naming the following as the four varieties: 1. That form which proceeds from physical causes. 2. That resulting from the activity of a pseudo-fovea simultaneous with that of the anatomical fovea. 3. A form associated with cerebral lesion. 4. A form not accounted for by any other hypothesis than that there is a cortical dissociation, which is the basis upon which hysteria is explained by the majority of modern neurologists. C. H. M.

MONOCULAR DIPLOPIA.—POLLOCK, W. B. INGLIS, Glasgow, Scotland (*The Lancet,* Aug. 8, 1908). The writer separated all cases arising from optical conditions in the anterior segment of the eyeball into two groups—the first with double pupil, and the second where irregular refraction by the cornea and lens produced two or more images on the retina (monocular polyopia). The first group included such conditions as a band passing across the pupil, whether congenital in origin or due to inflammatory processes, or the condition of irido-dialysis. In these cases diplopia only occurs if the object was out of focus for the eye. Among the second group were a number of varied affections. The lens when dislocated so that the edge passed across the pupil always caused monocular diplopia. Both images were out of focus, the one formed through the margin of the lens was as if myopic, while the other due to the aphakic condition resembled hypermetropia. Irregular corneal refraction from old superficial ulceration occasionally gave rise to diplopia, but generally of an indefinite character. It was more persistent than some of the other forms. That due to irregular lenticular astigmatism was comparatively rare, except when due to incipient cataract.

The question of the possibility of the retinal origin of monocular diplopia was most interesting. Constentin reported a case where diplopia occurred due to detachment of the retina, the entire upper portion of which was applied to the lower half of the retina, the latter still being in situ and the light thus affecting two portions of the retina at the same time. Dr. Pollock's case was that of a woman with double choked disc. She had diplopia in one eye during the early stage of regression of the edema, and he advanced the theory that the diplopia was due to a shrinkage of the retina, which caused slight wrinkling of the layer of rods and cones at the mucula. Light converging to a focus would then affect two neighboring regions and so produce the diplopia.

C. H. M.

IMMEDIATE TREATMENT OF SERIOUS OCULAR CONDITIONS BY THE GENERAL PRACTITIONER.—CHENEY, F. E., Boston (*Boston Med. and Surg. Jour.*, Aug. 13, 1908), considers acute glaucoma one of the most important emergency eye diseases to be recognized by the general practitioner by whom it is often seen first. The severe constitutional disturbance, pain and nausea are apt to obscure the local trouble and overshadow its seriousness. While the ocular symptoms may not be marked in all cases, the pupil is the key of the situation. In iritis it is small and inactive. In glaucoma it is large and generally quite immobile. In iritis, delay may mean the formation of adhesions and interference with vision. The most characteristic sign is circum-corneal injection; the most important step in treatment, full dilatation of the pupil. Atropin may have to be assisted by leeching. In ophthalmia neonatorum cleanliness is the essential, and the new silver salts, particularly argyrol 25 per cent., give excellent results. In perforating wounds, the possibility of infection must always be considered, and the injured eye cleansed as thoroughly and gently as possible. After irrigation atropin should be instilled, a mild antiseptic ointment introduced and the eye bandaged. A good dose of Epsom salts should be given, with calomel or some other active cathartic. A leech to the temple is good routine practice, and at times of the greatest value. Bandaging is contraindicated in burns and extensive lacerations of the conjunctiva, which are apt to be followed by mucopurulent secretion. Irrigation and cold applications are then needed. All the cases mentioned should, of course, be transferred to the care of an oculist as soon as possible, and this is particularly important in cases of prolapse of the iris and of penetration of the globe by a steel or iron foreign body. P. H. F.

ON FETAL INFLAMMATIONS OF THE EYE.—SEEFELDER, R. (From the eye clinic of Prof. H. Sattler in the University of Leipzig. *Deutsche Medizinische Wochenschrift,* 1908, No. 28, p. 1233), considers the occurrence of an ectogenous purulent infection of the eye in utero with intact fetal membranes as not proven and improbable. This seems to be different in syphilis, as observed by Reis in a fetus of 8 months with bilateral severe parenchymatous keratitis, which Reis attributed to an ectogenous infection of the cornea. The amniotic liquor in syphilis of the maternal and fetal organisms is freely exposed to infection, as there is a syphilitic affection of the placenta, and in the intestinal canal of syphilitic fetuses an abundance of spirochætæ has been found. Besides this there are numerous observations of the transmission of micro-organisms from the mother to the fetus, so that the explanation of an endogenous infection of the eye during fetal life meets with no difficulties. Seefelder shows, from literature and his own clinical and anatomical examinations, that all parts of the eye in fetal life are subject to inflammations, the consequences of which may, at birth, present various aspects, especially the opacities of the cornea, may be sequels to intrauterine inflammations. This view is strengthened by the occurrence of blood vessels in the cornea. Iridocyclitis, with subsequent hydrophthalmus and atrophy of the whole eyeball, have also been observed as due to intrauterine inflammations. C. Z.

## MUSCLES.

Isolated Paralysis of the External Rectus in Homolateral Otitis Media.—Peyser, Alfred, Berlin (*Berliner Klinische Wochenschrift,* 1908, No. 26, p. 1231). In the course of an acute purulent otitis media, complicating scarlet fever, a subperiosteal abscess developed in the temporal fossa with paralysis of the abducens on the same side. After opening of the abscess the paralysis of the abducens subsided later on. Peyser attributes the palsy, not to an intracranial process, but to propagation of the inflammation through the external soft parts into the orbit.

C. Z.

Paralysis of the Abducens Nerve Associated With Otitis Media.—Knapp, Arnold, New York (*Arch. Ophthal.,* New York, September, 1908, xxxvii, 552), reports a case of paralysis of the external rectus muscle associated with an uncomplicated inflammation of the middle ear. Recovery from the paralysis occurred at the end of two and one-half months.

The author believes that the paralysis was due to involvement of the Gasserian ganglion, and thence to the sixth nerve at the apex of the petrous pyramid, and that the extension of the purulent process from the tympanum was along the cancellous bony tissue surrounding the osseous labyrinth, or through the carotid venous plexus. W. R. M.

On the Operative Treatment of Concomitant Squint.—Kuhnt, H., Bonn (*Zeitschrift fuer Augenheilkunde,* xx, 1908, 231), gives a critical review of the treatment of concomitant squint, based on his experience of 28 years. If the deviation is less than 15°, non-operative measures are adopted. If not successful, or in deviations of from 15° to 25°, the operation is indicated. The angle of deviation, the field of fixation, the limits of motility of the eyes, the binocular field of vision, eventual diplopia are tested by repeated examinations. Kuhnt is very averse to the simple tenotomy, and has devised a graduated tenotomy which is described. The advancement of the antagonist with or without that of Tenon's capsule is the favored operation. Kuhnt describes his modification of advancement. If this is not sufficient, the graduated tenotomy is added. C. Z.

## MYOPIA.

An Unusual Degree of Myopia in a Pure Blooded Negro. Kollock, Chas. W., Charleston, S. C. (*Ophthalmic Record*, September, 1908). The author has only observed two cases of myopia in several thousand pure blooded negroes which he has examined. One case did not exceed 3 D., the other case was in a woman aged 22, who had 18 D. in one eye and 15 D. in the other. Myopia is not at all uncommon in mulattoes. M. B.

The Relation of Nearby Work to Myopia.—Thorner (*Wiener Medizinische Wochenschrift*, May 16, 1908). There are two forms of movements of the eye, the continuous form, which is slow, and the discontinuous one, which appears in the form of jerks. The latter movement pulls the sclera more forcibly than the former. By looking at a distance the movements of the eye are continuous; by reading they are discontinuous. In one second seven discontinuous movements are made; the eye bulb is in one hour jerked over 25,000 times. In writing, drawing and manual work there are only one-sixth as many discontinuous movements as in reading; and this explains the fact that watchmakers, engravers, embroiderers are not as prone to become myotic as typesetters, who have to read a good deal. The jerking is more intense the nearer the book is kept to the eyes. J. G.

On Relations Between Myopia and Astigmatism.—Steiger, Adolf, Zürich (*Zeitschrift fuer Augenheilkunde*, xx, 1908, p. 97), reached, from his observations on 1,942 myopic eyes, in which the corneal astigmatism and the degree of myopia were determined, the following conclusions: The question as to the relations between myopia and astigmatism requires further studies. The decrease of astigmatism at the same period in which the myopia increases calls for investigations on youthful eyes, especially of the same ages. Material of the practice is not well adapted for these researches, as the subjective ailments due to astigmatism bring mainly complicated myopes to the ophthalmic surgeon, while cases of simple myopia go to the optician. It seems certain that in very young myopes high astigmatism is more frequent, whence, however, an etiological dependence of myopia from astigmatism cannot be inferred. An etiological dependence of the higher degrees of astigmatism according to the rule from myopia must be declined. In all these examinations a principal distinction must be made between astigmatism according to the rule and the inverse type. Inverse astigmatism cannot possibly be a causal element of myopia. But as it is unusually frequent in myopia similar or equal causes of myopia and inverse astigmatism are surmised. C. Z.

## NERVOUS SYSTEM.

THE DIAGNOSTIC IMPORTANCE OF PUPILLARY SYMPTOMS.—BUNKE (*Wiener Medizinische Wochenschrift,* May 16, 1908). True reflex paralysis of pupillary reaction was believed to be found only in locomotor ataxia and in post syphilitic paralysis; it was also presumed that pupillary rigidity existed only in cases where anatomical degeneration of the posterior columns of the medulla had taken place. The author, however. proved that this rigidity of the pupil was to be found also in dementia præcox in Katatonic stupor where the pupils react either tardily or not at all and in hysteria; the pupils may be either dilated at their maximum. or may be very narrow; these disturbances have no anatomical basis. Both Trendelenburg and the author, after many experiments with animals, concluded that the medulla oblongata has no relation to the innervation of the pupil. J. G.

A NEW PUPILLARY PHENOMENON.—REDLICH, E. (*Wiener Medizinische Wochenschrift,* Aug. 22, 1908). In long, continuous and extensive muscular contraction there is often observed maximal pupillary contraction with a loss of reaction to light; no satisfactory explanation of this phenomenon has as yet been given. It is possible that the cause of this might be found in the changed condition of tension and circulation. If an irritation of the sympathetic were to be the cause of this phenomenon we would expect to find the pupil dilated, but the reaction to light would not be lost.

Westphal considers the symptom as one of general muscular rigidity. J. G.

A CASE OF PARTIAL AUDITORY AND VISUAL APHASIA WITH OBJECT-BLINDNESS DUE TO AN ABSCESS OF THE BRAIN.—RUSsel, Colin K., Montreal (*The Montreal Med. Journal,* July, 1908). The patient was first seen October 10, 1906. Three weeks previous he had a peritonsillar abscess on the left side of his throat, and at the same time had two small abscesses in the floor of his mouth. These all burst in about a week or eight days, and he felt much better. His appetite improved, etc., for two days; he then complained of headache and nausea, but did not vomit, and went to bed twelve days before coming under observation. The headache continued to be severe. His wife noticed then that he could not always remember names of people or objects, and when people's names were mentioned he seemed doubtful about who they were, although he could understand fairly well everything that was said to him. A week before coming under observation he could still read and write, but could not understand figures. The trouble with his speech had been growing worse. On examination, temperature, pulse and respiration were normal; he had had no convulsions. No evidence of motor or sensory paralysis. Abdominal and epigastric reflexes absent on right side, present on left. The cranial nerves showed a mild grade of optic neuritis more marked on the left side and right homonymous hemianopsia. There was a very evident difficulty in conjugate lateral deviation to the right, possibly due to the hemianopsia. A watch was heard normally in the left ear, but was not heard on contact on the right side. Otherwise the cranial nerves were normal. The patient was quite conscious and understood most simple commands, but was apt to continue one movement when the command was changed to another. There was absolute alexia and word blindness, i. e., reading was impossible; he cannot even spell out the letters nor does it help him to trace the letters with his finger. He cannot read numbers; writing and copying are also impossible. There was some object-blindness, although he seemed to recognize his sons, that they were his sons; he could recognize but not call them by name. An abscess of the brain was diagnosed, and on account of the partial word-deafness, complete word-blindness and the hemianopsia, it was located between the angular gyrus and the posterior part of the first temporal convolution. The patient died 24 hours after he was first seen. Only a very partial autopsy was allowed, merely a trephine opening in the skull. The skull was trephined three-fourths of an inch below the parietal eminence so as to expose the brain over the posterior extremity of the fissure of Sylvius. The meninges and surface of the brain were slightly congested, the convolutions flattened. On incision of the cortex we came immediately down on an abscess about one inch in diameter, circumscribed but with a definite wall, containing thick, greenish, inodorless pus. As near as we could make out the abscess cavity lay in the angular gyrus and the extreme posterior part of the first temporal convolution. Apparently we had here primarily a condition of intra-cortical sensory aphasia, the optical aphasia of Freund, where the patient, owing to the fibres connecting the auditory word centre in the posterior part of the first temporal convolution with the visual occipital cortex being interrupted, would not recall the names of objects, nor persons seen, nor recall the visual image associated with names of objects or persons. At the same time spoken and written language were not interfered with. With the gradual growth of the abscess the optic radiation became involved, causing homonymous hemianopsia, and then the angular gyrus with first the loss of power of recognizing numbers and later complete alexia, then partial auditory aphasia was caused as the abscess touched on the posterior part of the temporal convolution. This case has many points of interest. It calls attention to possible sequelæ of a very serious nature of the more or less ordinary peritonsillar abscess. The septic material evidently was carried directly up the carotid to the middle cerebral artery. Secondly, it would tend to confirm Mills' idea that the centre for numbers is distinct from the centre for words and letters. Mills would place the memory for names in a centre by itself below the auditory word, centre in the temporal lobe. Bastian and Ross, on the other hand, argue that proper names being the last acquired property of language are lost first, if the functioning power of the auditory word centre be weakened or impaired in any way. Whether the amnesia verbalis at the outset of this case was due to the impaired function of the auditory word centre owing to the partial injury, or as appears more probable to me, due to the involvement of the commissural fibers between the auditory word centre and the occipital lobe, is impossible to decide. F. A. and P. G.

Paralysis of the Sixth Nerve After Lumbar Anesthesia With Tropacocain.—Gontermann, C., Berlin (*Berliner Klinische Wochenschrift,* 1908, No. 33, p. 1522). On the eighth day after lumbar injection of 0.0625 tropacocain, without adrenalin, between the 1st and 2nd lumbar vertebræ, the left abducens became paretic, and also the right one slightly. Recovery after six weeks. The late occurrence of the paralysis spoke for a toxic affection of the nuclei, not through direct local action, but by way of absorption, similar to nephritis after lumbar anesthesia and other palsies, e. g., the postdiphtheric. C. Z.

TELEOLOGY AND INTERPRETATION OF NYSTAGMUS.—FRIDENBERG, PERCY, New York (*Annals of Ophthalmology*, October, 1908). The writer considers this anomaly of ocular motility from the biological and psychological aspect as an attempt on the part of the organism to compensate, by a series of fixation efforts, for diminished vision or disturbed balance. The various clinical forms of nystagmus can be arranged in two main groups, according as they are visual or equilibrational. The first type, usually oscillatory in character, has no directional component, and resembles a groping for sight. It may be considered as a reversion to a lower type of function suggesting ameboid movements. Congenital nystagmus, so called, is usually of this type. The clonic twitching seen in many cases of labyrinthine disease is typical of the second group with marked directional character, and represents, physiologically, the fixation of a series of objects in motion, or their successive fixation during subjective rotation. A mechanical analysis of the two forms of nystagmus shows that in one case we have to deal with a pure oscillation, while in the other there is a clonus composed of two unequal components. The interpretation of reflex nystagmus in labyrinthine and cerebellar disease is facilitated by the application of these teleological criteria, which also explain how this important symptom is modified by rotation, fixation and sensations of subjective or objective motion. C. H. M.

A CASE OF HEREDITARY NYSTAGMUS.—CASPAR, L., Mühlheim a. Rh. (*Centralblatt fuer praktische Augenheilkunde*, 1908, p. 199.) The patient, a man aged 31, had, from early childhood, horizontal nystagmus. There was irregular and regular myopic astigmatism of right eye, with correction V=5/l, hypermetropic astigmatism of left eye, with correction V=5/xxx. Fundus, excepting atrophy of the chorioid around the optic nerve, was normal in both eyes. His two brothers, none of his five sisters, the two sons, none of the five daughters, of the sister of his mother had the same affection: none of the five daughters of the second sister of his mother, nor the son nor one of the five daughters of the third sister of his mother. The history shows a hereditary transmission of nystagmus through the parents of the mother to the male descendants. Next to the great number of children the predominance of the female progeny is remarkable. Most likely there was a hereditary syphilitic element. C. Z.

## OPERATIONS.

Regional Anesthesia in the Orbit.—Loewenstein, Arnold. (From the eye clinic of Prof. A. Elschnig in the German University of Prag. *Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 1, 1908, p. 592.) The sensitive nerves of the eyeball are the long ciliary nerves from the nasociliary nerve and the short ciliary nerves from the ciliary ganglion. The long ciliary nerves arise from the nasociliary nerve shortly after the long root to the ciliary ganglion has branched off. Thus the sensitive nerves of the eyeball are gathered at a point near the ciliary ganglion. An injection, directed towards the ciliary ganglion, influences all sensitive nerves of the eyeball. Guided by preliminary anatomical studies, Prof. A. Elschnig performed 26 operations in ganglion anesthesia, viz., 18 enucleations, 7 exenterations and 1 cyclodialysis.

After cocainization of the conjunctiva a Pravaz's syringeful of a 1 per cent. solution of cocain is injected through a strong needle 5 cm. long. The lateral commissure is stretched towards the temple and the needle introduced through the conjunctiva, close to the lateral orbital margin a little below its middle point, along the lower border of the external rectus muscle and the lateral orbital wall, and finally lifted inwards until about 0.5 cm. of its shaft is still visible, and one-half syringeful injected. By slight lever motions one must guard against the needle being caught in the optic nerve or a larger blood vessel. Then the anesthesia of the eyeball, which ought to be established within two minutes, is tested by slight pressure on the globe. If this is not anesthetic the needle is pulled back about 1 cm. and protruded in a changed direction. If no pain is felt, subconjunctival injections of cocain, about 15 mm. from the limbus, are made in inflammatory cases. Most patients were given 0.01 morphin half an hour previously, which had a beneficial psychical effect. In non- or slightly inflamed eyeballs the pain was equal to nought, but also in most cases of inflamed eyeballs (in 11 out of 13) complete anesthesia was attained. In none of the cases a bad effect of cocain was observed. In order to show the course of the anesthesia the cases are arranged in tabular form. C. Z.

Complete Peripheral Capsulotomy.—Valk, Francis, New York (*Ophthalmic Record,* August, 1908). A cystotome has been devised by the author which in every respect resembles the usual cystotome, except instead of a knife tip set at right angles to the shank it has a needle point. It can be moved about in the pupillary space without wounding the margins of the iris. The instrument is introduced underneath the iris in making the lower capsular tear, and is carried on around to one side and then above, where the iris is pushed upward and then downward to the starting point. A round piece of capsule is thus detached which probably comes away with the lens. He finds that since adopting this method he does not have to do subsequent needlings for opaque capsules. M. B.

THE TREATMENT OF ENTROPION AND TRICHIASIS BY THE OPERATION "EN VANNE."—DELAND and REVEL (*Annales d'Oculistique,* May, 1908). This operation consists in splitting the lid, a la Arlt, into two layers—the anterior, including the skin and cilia, and the posterior, the tarsus and conjunctiva—sliding back the anterior layer and retaining it in the new position by sutures passed through the lid. This is precisely what was done by the late Dr. Richard Levis some fifteen or twenty years ago. See Norris and Oliver's System, Vol. III, p. 98.

G. C. H.

CONCERNING IRIDO-SCLEROTOMY.—VALUDE (*Annales d'Oculistique,* May, 1908) reports the case of a patient, 65 years of age, in which he performed this operation for chronic glaucoma. The right eye was entirely blind and vision was reduced in the left to hand movements at 20 centimeters. The operation was performed, according to La Grange's directions, on the left eye.

Three weeks later the eye was quiet, the media were clear, and the vision and the ophthalmoscopic picture were the same as before the operation, but the eye was harder than before, the anterior chamber, which had been deep, was obliterated, and there were glaucomatic pains.

The author thinks that this case shows that hypertension is not in direct relation with the size of a sclerotomy, and that the question how iridectomy and sclerotomy act in the case of glaucoma is not yet answered. He believes that the effect of sclerotomy alone is practically nearly all nil, and that iridectomy is the basis of all operative action in glaucoma.

He nevertheless maintains that clinical experience has proved that sclerotomy and iridectomy combined give better results in the treatment of chronic glaucoma than does iridectomy alone.

G. C. H.

FILTERING CICATRICES BY TWO METHODS.—HEBERT, H., Bombay (*Brit. Med. Journ.,* Sept. 12, 1908). The writer exhibited eight eyes operated upon by the "wedge-isolation" method more than six months ago; in six the cicatrices were most satisfactory and there is relief of tension and preservation or improvement of vision; these must be classed as "filtering." The remaining two showed fistulous scars. He has operated upon 63 primary glaucomas by this method; the only unsatisfactory result in the whole series, excepting in three cases, including the two mentioned above, was a return of tension, apparently temporary.

The operation consists of the separation, under the conjunctiva, of a narrow strip of sclero-corneal tissue immediately above the upper visible corneal margin, deep enough at its middle to reach to the posterior surface of the cornea, and remaining attached to the conjunctiva at the limbus. Through this attachment it usually becomes a little displaced forwards after the operation by the accumulation of aqueous under the conjunctiva, and is thus prevented from uniting with the tissues from which it has been divided. It is nourished afterwards mainly or solely through its conjunctival connections, and therefore undergoes some shrinkage.

The separation is effected by means of a very narrow Graefe knife, not more than 0.8 mm. in width, used by puncture and counter-puncture. The strip is as short and as narrow as it can be made conveniently. It is formed by means of a nearly vertical upward incision, behind the wedge, and a nearly horizontal incision below the wedge.

Though not essential, a small basal iridectomy is advisable, in addition to eserin instillation before and after operation, to keep the iris quite free from the wound.

Herbert mentions the following points of importance in connection with this operation: 1. The strip of tissue must be quite close to the limbus. 2. Any increase in the length of the strip of tissue tends to the formation of a fistula, for the longer the wedge, made as directed, the deeper it is. 3. The wedge must not be too broad superficially. 4. There must be a long adherent conjunctival flap. 5. These operations are unsuited for cases of secondary glaucoma in which vitreous is likely to enter the wound, since vitreous in the wound prevents filtration.

He also speaks of a second and smaller operation which he has performed recently for the relief of tension (subconjunctival paracentesis), reporting an instance of chronic non-congestive glaucoma with extremely contracted field and vision of 5/ix in which the other eye had become totally blind; the paracentesis operation was performed six months ago and vision is now nearly 5/v, tension —1 and fields apparently a trifle larger.

C. H. M.

Tapping the Anterior Chamber.—Harman, Bishop, London (*Brit. Med. Journ.*, Sept. 12, 1908). In many cases of iridocyclitis the collection of the aqueous under strict aseptic precautions is desirable, notably in suspected tubercle. Up till now one had to be content with catching what fluid was possible after puncturing the anterior chamber with a needle. This practice is wasteful of material and is liable to error by contamination from the conjunctiva. Mr. Weiss has made to his design a hollow needle with a cutting spear-shaped head. This can be attached to a syringe, the cornea pierced, and the aqueous extracted with perfect security at one operation. C. H. M.

## OPTICS.

On the Use of Lenses Specially Adapted for the Estimation of Bi-Focal Vision.—Tooke, Fred. T. (*Montreal Medical Journ.*, August, 1908.) In describing the features of bi-focal lenses the ophthalmic surgeon has heretofore found that a great deal has of necessity had to be left to the imagination of his patients. The first actual experience of their particular points of vantage, as well as some of the disagreeable features which these lenses may produce, may only be appreciated by the patient after his prescription has been dispensed, and when he is wearing his glasses for the first time.

To assist in the explanation of a great deal of what bi-focal lenses will and will not do, and to avoid a great deal of misunderstanding to which both patient and consultant have been subjected, I have arranged this simple device. I employ a trial frame with three cells, or one that will accommodate three lenses. When I am refracting a presbyopic patient with compound hypermetropic or myopic astigmatism, or with mixed astigmatism, in the cell nearest the eye I place the sphere and in the middle one the cylinder required, thus registering the distance vision. Should the condition be one of simple astigmatism the sphere is, of course, dispensed with, while in ordinary hypermetropia or myopia one naturally does without the cylinder. In order to estimate the presbyopic effect of a bi-focal for reading I insert in the front cell a special lens which Messrs. R. N. Taylor & Company, of Montreal, were kind enough to make for me at my suggestion. This lens consists of a plano, to the lower half of which is cemented a wafer corresponding approximately to the presbyopic correction required. In this manner, on looking forward, regular distance vision is unimpaired by the plano, but on looking down through the wafer my patient is able to appreciate his reading correction. I have had these made up in pairs of +1.00D, 2.00D and 3.00D, finding that these spheres are sufficient to give both my patient and myself an approximation of the bi-focal effect.

H. V. W.

## OPTIC NERVE.

THE OPERATIVE TREATMENT OF OPTIC NEURITIS.—HORSLEY, VICTOR, London (*Ophthalmoscope*, September, 1908). All cases of optic neuritis should be relieved as soon as possible by operative treatment. This operative treatment, in the absence of other indications, should be opening of the subdural space in the temporal or subtentorial region. The attending physician must be held responsible for consequent blindness if the neuritis be not thus relieved as soon as possible. M. B.

AFFECTIONS OF THE OPTIC NERVE IN PREGNANCY.—WEIGELIN, S. (From the eye clinic in the University of Tübingen. *Archiv fuer Augenheilkunde*, lxi, 1, 1908, p. 1), went over the material of the clinic of the last ten years with regard to the occurrence of affections of the optic nerve in pregnancy which were not complicated by diseases of other organs. All cases were recently reexamined, especial attention being given to the inner organs and the nervous system, at the medical university clinic. The following six cases are described in detail:

Case 1.—Woman, aged 37. Amaurosis during the tenth pregnancy from optic neuritis passing into atrophy. Amelioration of one eye by artificial abortus. As a relapse of the neuritis and total blindness was to be feared from a renewed gravidity, artificial sterility was produced by tying the ovarian tubes four months after delivery.

Case 2.—Optic neuritis in a woman, aged 37, during the tenth pregnancy. Improvement after spontaneous delivery. Relapse of neuritis with almost complete blindness during the next pregnancy. Improvement after artificial abortus.

Case 3.—Optic neuritis of a woman, aged 35, during the fourth gravidity. Relapses during the fifth and sixth gravidities. The neuritis was very slight, and almost normal vision returned after the relapses.

Case 4.—Optic neuritis with almost complete blindness during the third and fourth pregnancies in a woman, aged 30, with relative improvement after early spontaneous delivery. Total amaurosis from atrophy of the optic nerves, during the course of the fifth pregnancy.

Case 5.—Slight optic neuritis of one eye of a woman, aged 25, with visual impairment during the second pregnancy. Complete recovery after spontaneous delivery.

Case 6.—Unilateral retrobulbar neuritis in a woman, aged 25, during pregnancy. Restoration of vision after spontaneous delivery.

A review of the cases shows that the affection of the optic nerve generally occurred in a later pregnancy, and then with predilection in from the fourth to the seventh months. The visual impairment represented all degrees from a slight decrease of vision to amaurosis. The favorable influence of artificial or spontaneous termination of pregnancy, was noticeable in all, as well as the evil effect of repeated pregnancies. Weigelin concludes that there is a causal relation between pregnancy and affections of the optic nerve, and quotes as analogon the "neuritis gravidarum" of other nerves, so called by Windscheid. He attributes the cause to a process similar to eclampsia in which a direct damage to the nerve centers by toxins, circulating in the blood, is surmised. It is of eminently practical importance not to overlook the connection of an ocular affection with pregnancy. If threatening symptoms occur artificial interruption of pregnancy is a remedy, the more reliable the less there is organic affection of the optic nerve and the shorter the duration of the optic neuritis. In serious cases amaurosis from relapses may be averted by preventing repeated pregnancies. C. Z.

ON THE COINCIDENCE OF ATROPHY OF THE OPTIC NERVES WITH UNIVERSAL ADIPOSITY IN A BROTHER AND SISTER.—SIEVERT, H., Mannheim (From the eye clinic of Prof. E. Krückmann in the University of Koenigsberg i. Pr. *Zeitschrift fuer Augenheilkunde,* xix, 1908, p. 544). A girl, aged 9 years, of healthy parents, was brought to the clinic on account of strabismus. The examination revealed compound myopic astigmatism, alternating divergent squint, gray atrophy of the optic nerves and intense adiposity. A brother of hers, aged 15, presented the same marked adiposity, horizontal nystagmus, divergent strabismus, gray atrophy of the optic nerves and slight concentric contraction of the visual fields. The other four children of the same family were healthy. The cases did not correspond with the ones published, in which a combination of affections of the optic nerves, with temporal hemianopia, anomalies of growth, as acromegaly, gigantism or adiposity, existed and were ascribed to changes of the hypophysis. In Sievert's cases every known etiological element was lacking. They could not simply be attributed to an affection of the hypophysis, as all the symptoms of it were missing, viz., deformity of the skull at the sella turcica and bitemporal hemianopia. C. Z.

## PARASITES.

LARVÆ IN A CARCINOMATOUS ORBIT. — REIS, VICTOR (From the eye clinic in the University of Lemberg. *Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 11, 1908, p. 66). A woman, aged 60, suffered for three years from an ulcer on the right eye. At the examination the orbit was converted into a large ulcer, extending from the frontal protuberance beyond the lower orbital margin and from the zygomatic process to the lacrimal fossa. The lids and all soft parts were lacking and nothing but a deformed stump was left of the eyeball. The whole orbit was filled with larvæ, 240 of which were removed with a pair of forceps. After irrigation with sublimate solution, the temporal osseous wall of the orbit lay bare, while the remaining part of the ulcer was smooth, probably a work of the larvæ. Under iodoform granulations developed, filling the depth of the ulcer. The larvæ had all the characteristics of lucilia, a species of flies. The incident literature is quoted. C. Z.

OCULAR AFFECTIONS IN HUMAN TYPANOSOMIASIS.—MORAX (*Annales d'Oculistique,* July, 1908). The ocular complications noted in connection with typanosomes in the blood, a disease of the Congo, are palpebral edema, iritis and chorioiditis.

These ocular affections have often coincided with the febrile attacks and the discovery of typanosomes in the blood. They are usually of a mild form and promptly cured.

The symptoms observed, the unilateral character, the infectious form and the similarity to the ocular manifestations observed in animals affected by the typanosomes, make it very probable that there is a proliferation of these bacilli into the tissue of the iris or of the ciliary body. G. C. H.

## PATHOLOGY.

THE PATHOGENESIS AND THERAPY OF TURMSCHADEL.—DORFMANN, Budweis (*Graefe's Arch.,* lxviii, H. iii, July 14, 1908), gives the history of three cases of turmschädel. The first was seen in a 13-year-old boy. The peculiar shape of the skull had existed from birth. There was exophthalmos of considerable degree somewhat more pronounced on the right side. Divergent strabismus of O.D. V.= fingers at 20 cm. O.S. fingers at 1 M. Both papillæ were green-white, with edges veiled in places. Vessels contracted. The second case was seen in a girl of 4 years—turmschädel from birth. Exophthalmos so marked that the lids scarcely closed. Divergent strabismus O.D. V.=6/xxx; O.S. V.=6/lx.

Case 3 was in a boy 3 years of age; skull normal at birth. Curvature of the spine at 9 months. The changes in the skull had been remarked for three months, and were those of beginning turmschädel. There was bilateral exophthalmos, horizontal nystagmus, optic atrophy, nerves gray-white, edges well defined. Vessels narrow.

Radiographs were made in all three cases. The changes were much the same in all. Thinning of the calvarium, numerous impressiones digitatæ and juga cerebralia, which are not present normally. Excavation of the anterior and middle cerebral fossæ, contracted orbits, roof of the orbits steeply inclined.

The author's conclusions are: 1. In consequence of premature synostosis changes take place in the bones which are a constant finding in the radiographs and which are due to increased intracranial pressure.

2. This increase in intracranial pressure, favored by local osseous changes in the neighborhood of the optic nerve, causes a papillitis, with consecutive atrophy.

3. That by a trepannation at the proper time the intracranial pressure and its deleterious effects may be overcome. W. Z.

EPITHELIAL MIGRATION AND THE DEVELOPMENT OF EPITHELIAL CYSTS WITHIN THE EYE.—URMETZER, Wien (*Graefe's Arch.*, lxviii, H. iii, July 14, 1908). Cysts whose development can be traced back to epithelium may rightly be termed epithelial cysts. The following classification of cysts may be made whose origin is known from histologic study: A. Epithelial cysts which have an epithelial covering, and are present in a tissue which normally contains neither epithelium nor glands. To this class belong: 1. Conjunctival epithelial cysts originating from an epithelial base. 2. Epithelial cysts of traumatic origin. These may arise in two ways—rarely by implantation, more frequently by proliferation. The former can be distinguished from the latter only when epithelial scales or glands of the follicles of the cilia give rise to them. This variety of implantation cyst has thick walls and cheesy contents. They are recognizable through their gray to yellowish-white mother of pearl glistening color. They approach the cholesteatomata. They result from a perforating wound carrying corneal or conjunctival epithelial shreds into the eye, and they are with difficulty distinguished from cysts which arise from ingrowth of corneal or conjunctival epithelium along the walls of the wound. Clinically these are seldom to be diagnosticated. Their walls are delicate, the contents fluid, their appearance transparent gray. These cysts are divisible into (a) those lying more or less without the iris epithelial cysts of the conjunctiva, the cornea, the sclera and the anterior chamber, respectively, through communication with the corneal chamber, and scleral chamber cysts; (b) those epithelial cysts lying within the stroma of the iris—true iris cysts. The connection of such cysts with epithelial cysts lying without the iris may result in corneal, respectively, to scleral chamber iris cysts.

B. Endothelial cysts showing superficial endothelial lining. These are distinguishable from epithelial cysts by their connective tissue origin, that they usually arise spontaneously and are not of traumatic origin and can only develop where endothelium is normally present. In the iris they arise from sacculation of a crypt.

C. Cyst-like formations—pseudocysts—which are due to union of the iris with the cornea, respectively, with the lens. They are the sequelæ of inflammation, and for that reason nearly always show simultaneously a fresh or subsiding iritis.

The present paper has to do principally with the development of cysts arising from the proliferation inward of epithelium from the surface of the eyeball.

The first case was one of perforating wound of the sclerocorneal juncture; the second, one of ring abscess following linear extraction of cataract. The microscopic findings in these two cases agreed in showing that the superficial epithelium was continued along the margins of the wound into the wound cavity without interruption.

The third case was one of an injury of unknown nature, the wound having healed without treatment, the eyeball subsequently shrinking. It showed that the epithelium had found its way into the parenchyma of the cornea in the form of pegs, globules or pearls which, in part, remained in connection with the epithelial covering, and in part separated therefrom by normally or cicatricially altered corneal tissue.

In the fourth case, an eye removed because of sympathetic irritation after iridectomy for glaucoma and subsequent extraction of the lens, the depressed epithelium was visible as pearls, similar to chancroidal pearls.

In the fifth case, one of penetrating wound by a cow's horn, which at first did well, but later showed infection, the epithelial formations were of varied appearance and some distance from the epithelial covering and apparently not connected therewith.

The migratory epithelium may creep forward into the anterior chamber and line the same, not always completely, however, sometimes in stretches on the posterior surface, the point of origin for the further development of anterior chamber cysts. This is illustrated in a case of glaucoma where the eye was later removed because of pain.

In the following case the eye was removed after an extraction complicated by the loss of vitreous and incarceration of the iris. An epithelial lined chamber was in direct connection with the epithelial pegs which penetrated between the lips of the wound. In one place only were the two separated by Descemet's membrane. The author believes that soon after the extraction the epithelium was drawn through the wound into the upper part of the anterior chamber, which was covered with exudate, and there developed further. Another case showed much the same condition.

Several of the author's cases show how the penetrated epithelium covered the anterior and posterior walls and in this way formed an anterior chamber cyst.

A case is described where the sclerocorneal cyst was visible and observed to increase in size.

In a case of secondary glaucoma where an iridectomy had been done one year before there was incarceration of the iris. Epithelium was found on the anterior surface of the iris; and two other cases show that the epithelium may find its way into the iris tissue or even upon the posterior surface of the iris.

That the migratory epithelium may reach the equator and even the posterior surface of the lens was seen in an eye enucleated after iridectomy for glaucoma.

The penetration of the epithelium is, first of all, for reparative purposes. Elsewhere in the economy a greater amount of new-formed tissue is supplied than is necessary for the purpose. This subsequently disappears. A further cause for the penetration of the epithelium is the purpose of nature to cover all denuded surfaces so as to exclude them as soon as possible from outside infection. As a consequence infection seldom follows traumatic erosion, incised wounds with clean tools, or the pricking of the superficial corneal lamellæ (tattooing), provided there coexists no conjunctival disease or blenorrhea of the lacrimal sac. If splinters of stone or powder grains enter the corneal epithelium they are soon covered over by the epithelium, so that the entrance of pathologic germs along the track of the wound is prevented. At times the epithelium covers a greater area than is necessary. Necrotic masses as exfoliated corneal lamellæ in ulcus serpens and calcareous placques in atheromatous ulcers show a tendency for epithelium to grow upon their under surface. The effort of epithelium to grow inwards in wounds and lymph channels in the healing of wounds is seen in ulcus cruris, caries of the bone or in long-continued inflammations of the skin or mucous membrane.

Is the ingrowing of epithelium influenced by other conditions? Age has no bearing, the source of the epithelium has nothing to do with it. The nature of the underlying tissue seems to have some influence. The epithelium grows luxuriantly where it finds a well-nourished soil, as recent scar tissue, granulation tissue or the iris tissue. It does not flourish in hyalin tissue or in the capsule of the lens. Conditions such as are present when the wound is kept open by the presence in it of uveal tissue, lens capsule or retina favor it. Experience shows that all perforating wounds of the cornea show, in marked contrast to scleral wounds, a tendency to gape.

The results of this penetration of epithelium are varied. First of all, it delays healing of the wound and may prevent it, as epithelially lined surfaces do not unite. Where a complete chamber cyst forms, glaucomatous symptoms may develop, and this is the unsuspected cause of glaucoma in apparently normal cataract extractions, as the cyst is not macroscopically visible. Sometimes cysts form within the iris.

Changes which the encysted epithelium undergoes: Most of the epithelium was found to be one or two layered cuboidal cylindrical epithelium notwithstanding that it originated from pavement epithelium. This is explained by the pressure which is exerted upon it. As to the solid spheres of epithelium and the epithelial shells found in the cornea in new-formed exudate, if they are surrounded by vascular tissue and still possess the blastoderm of the basal cells they may develop into true cysts. If they lodge in avascular tissue or have left their basal membrane, no further growth takes place. They undergo fatty degeneration and are absorbed by leucocytes and the space later occupied by connective tissue. W. Z.

CONTRIBUTION TO THE PATHOLOGY AND THE PATHOGENESIS OF MICROPHTHALMOS.—FLEISCHER, Tübingen (*Graefe's Arch.*, lxviii, H. iii, July 14, 1908). The author's conclusions, based upon his own cases and those in literature, are:

1. That the extensive intimate union of the retina with the mesoderm present in the colobomatous cleft in the described case of microphthalmos was due to delayed solution of the invaginated mesoderm in the fetal cleft from the inner layer of the optic vesicle.

2. Adhesion of retinal folds with the lens, respectively, the posterior surface; adherent mesoderm as well as adhesion of the mesodermal bands which ascend from the floor of the orbit and are inserted into the posterior surface of the lens, have the same origin. Likewise the union of mesodermal portions of the tunica vasculosa lentis with the iris or the arteria hyaloidea persistens are to be considered as arrested malformations.

3. The common cause of the persistence of such strands is perhaps not an abnormal persistence or a too luxuriant growth of the mesoderm itself, but only as an abnormally strong adhesion of a normal mesoderm with the ectodermal structure whereby also a primary abnormal retention of the mesoderm must be thought of.

4. As, according to v. Hippel, the persistence of mesodermal strings in the fetal cleft is the only cause of colobomatous formations, so the abnormal adhesions between the ectoderm and the mesoderm which projects into the fetal cleft, as a result of which the metamorphosis of the mesoderm is hindered, must be considered as an important factor in the production of colobomata.

5. Abnormal adhesions of the mesodermal portions of the tunica vasculosa lentis play at times an important part in the causation of isolated colobomata of the iris and of the lens.

6. v. Hippel's view that in these colobomata we have an avatistic phenomenon receives further support in the finding of traces of a musculus retractor bulbi in the case of microphthalmos described in this paper.

7. The suspicion of v. Hippel that the rosettes in the microphthalmic eyes arise from branching of the vessels which turn up into the vitreous out of the inner leaf in the space formed between the inner and outer leaves of the secondary optic vesicle, finds confirmation in the author's case. W. Z.

PIGMENT EPITHELIUM IN THE OPTIC NERVE TRUNK IN LEUCOSARCOMA OF THE CHORIOID.—INSBERG, Berlin (*Graefe's Arch.*, lxviii, H. ii, May 19, 1908). While the property of pigment epithelium to become detached and wander into other tissue from its original site is well known, in this case they were found in a locality not before noted, as in a case of leucosarcoma of the chorioid the optic nerve trunk for a distance of 3 mm. behind the lamina cribrosa was infiltrated, in places so thick that the pigmentation in transverse section was visible macroscopically in the form of brown specks. The eye had been removed because of quiescent absolute glaucoma, and on section it was found that almost the entire temporal half of the globe from the optic nerve entrance to the ora serrata was involved in a spreading chorioidal tumor.

Microscopically the optic nerve was entirely atrophic and showed disseminated alteration. The septa were in great part irregularly thickened, and in places infiltrated with cells. Moreover, the vessels were surrounded by thick colonies of mononuclear round cells. Two large areas of such infiltrate were found about 1 mm. behind the lamina cribrosa in the temporal half of the nerve. By far the larger number of pigment cells lay within the areola spaces. They were more sparse in the septa and some lay on the lateral side of the pial sheath. Small scattered heaps of pigment were also found within this locality. The vessel walls were entirely free from pigment. Aside from the sclerotic thickening of the intima of the central artery of the retina with the formation of connective tissue and elastic fibers, the vessel was entirely normal. The pigment was all in the form of granules and pointed rods. The cells which contained this pigment differed in size, form and kind. In the connective tissue-parts the cells were oblong, with often very narrow nuclei, and both of the process-like ends of the cells were more or less dense with pigment. The cells may have had one of two sources—the glial cells or pigment epithelium. The author concludes that they were epithelial. He says that the pigmentation of the optic nerve, which is due to an infiltration of the trunk with pigment epithelium, is to be traced back to an active locomotion of these cells. Usually in the growth of pigment epithelium, the proliferation product remains in the neighborhood of its matrix, at the very least at one point, often in its entire base in connection with its native soil, and usually presents a continuous proliferation in epithelial union. Here, on the contrary, the pigment epithelium is isolated in the optic nerve and forms there in places strands and heaps.

He would not go so far as to assert that in these circumscribed cell heapings we have microscopic tumors, although its similarity to carcinomatous infiltration of the optic nerve is not to be denied. He would emphasize that the infiltration of the optic nerve with pigment epithelium gives to these cells an independent biological grade which, elsewhere than in epithelial cells, is exhibited by tumor cells. W. Z.

A CONTRIBUTION TO THE PATHOLOGY AND THE PATHOGENESIS OF CYCLOPIA.—SEEFELDER, Leipzig (*Graefe's Arch.*, Bd., lxviii, H. 2, May 7, 1908), records four cases. The first, which belonged to the Janus group of cephalothoracopagus, showed in the cyclopic eye two normally developed lenses and their vessel systems. The entire retina was plicated. There were inclosures of the retina in the optic nerve, a funnel-shaped excavation in the position of the optic nerve entrance, absence of nerve fibers in the optic nerve and retina, and a concentric constriction of the optic nerve 2 mm. behind the ball. According to Marchand, cephalothoracopagus has its origin in an early blending of two originally separated embryonal rudiments upon one germinal vesicle. The union takes place on the abdominal side—the forehead side. On the normally developed side of the face the two eyes develop from two different embryonal rudiments. The same is the case with the cyclopic eye on the defective side of the face. So far as it was possible to examine the optic nerve, a division or a union of two nerve trunks was not demonstrable. The peculiar anomaly of the papilla was not of the nature of a coloboma. The second case was one of typical cyclopic malformation. The union of the two halves, which were nearly of the same size, occurred along the fetal ocular cleft in such a manner that in both halves of the eye there existed a medianally directed coloboma of the iris and ciliary body which merged without intervention. In the region of the coloboma a wedge of mesoderm and an irregularly developed portion of the ciliary body encroached upon the interior of the globe. At this point numerous vessels entered the eye and were distributed to the structure of the tunica vasculosa of both lenses and supplied the anterior portion of a duplicature of the retina (which almost completely separated the two halves of the eye) with blood vessels. On the borders of the colobomata, and some distance removed, the retina as well as the epithelial coat of the ciliary bodies showed marked rucking. In the posterior half of the eye a large coloboma was present. In this area the pigment epithelium was absent and the chorioid and retina were atrophied. In the posterior section of the retina were numerous rosettes and a circumscribed glial growth. There was an absence of nerve fibers in both the retina and the optic nerve, and there was no indication of a papilla. The author says that the case offers a welcome explanation of the pathological anatomy of iris colobomata.

It shows that the iris coloboma is only the expression of a disturbance in the closure of the ocular fetal cleft similar to that which is present in the ciliary bodies. In the area of the coloboma every trace of the ectodermal portion of the iris was wanting, and the mesodermal portion was very incompletely developed. There was no evidence of an interference with the forward growth of the iris upon the anterior surface of the lens, or of a retrotraction of a completely developed iris.

The coloboma of the fundus resembles macular coloboma and has no relation with the closure of the fetal cleft, but has its origin in an atrophy of the chorioid. The degeneration of the retina and of the pigment epithelium is to be traced back to this.

The third case was one of *Diprosopus triophthalmus.* The fusion of the two, relatively well developed eyes, had taken place to the side and was limited to the sclera and ciliary muscle. There was no coloboma. The optic nerve and retina did not contain a trace of nerve fiber. The severe hemorrhage in the ciliary body and chorioid had without doubt occurred intra-partum and by direct squeezing of the strongly prominent eyes.

The fourth case belonged to the same group and was very similar to the above described case. In a single orbit there were two eyeballs united only by conjunctiva and loose connective tissue. Behind them lay a tubulo-alveola gland of the structure of an embryonal tear gland. It may have been either a dislocated lacrimal gland or an avitistic development, as in dogs and some other mammalia, orbital glands are normally present. At the posterior pole was a retrodisplaced muscle, probably the inferior rectus. The iris was poor in mesodermal tissue.

The investigations confirm the modern statement that in brainless aborted fetuses there is an entire absence of nerve fibers in the optic nerve and retina, with the exception that in the cyclopic eye in Case 4 there was a bundle of fibers developing, which the author and his colleagues considered to be nerve fibers.

Sachsalber's assertion that the ganglion cells of the retina have no outgrowths of nerve fibers when the basal optic ganglia are undeveloped was not entirely confirmed. The same author's view that in anencephaly the disease extends not only to the epi- but to the meso-blast could not be proven.

The author concludes that in cyclopic eyes there is a very early fusion of "a cell mass not yet differentiated into definite organs" (Fischel). In the second case of cyclopia the union of the rudimentary eyes took place in the stage of patulousness of the fetal ocular cleft. In Cases 3 and 4 there was, doubtless, from the beginning, two independent rudiments which lay so far from one another that they could develop without very pronounced hindrance. As to the reason for the genesis of cyclopia the author has nothing to advance. W. Z.

THE PATHOLOGY AND PATHOGENESIS OF CYANOSIS RETINÆ, WITH OBSERVATIONS UPON THE PATHOGENESIS OF GLAUCOMA.—BAQUIS, Florence (*Graefe's Arch.,* lxviii, H. 2, May 19, 1908). The object of this paper is to present the clinical history and the anatomic pathology of a case of bilateral amaurosis which developed quite suddenly in a young patient with congenital cyanosis. The patient was a male 11 years of age, who complained of severe dyspnea and of a cloud before his eyes. V. in O.D.=L.P.; O.S., hand movements, 30 cm. The entire skin, from the scalp to the extremities, was of a deep violet color. The visible mucous membranes were also involved. There were no hemorrhages. The superficial veins were everywhere visible, more through the number of their branches than through their dilatation, as the larger trunks gave the impression of being empty and flat. The heart was enlarged and there was a presystolic murmur over the apex. The radial pulse was 120. The liver and spleen were enlarged. The blood was brown from hyperglobulin. Red cells 8,500,000; white 23,000; hemoglobin (Fleisch) 112 per cent.

The skin of the lids was blue-brown, which in the tarsal conjunctiva and the retrotarsal fold reached the color of tartar. The bulbar conjunctiva was cyanotic and over it coursed coarse, almost black veins. There was exophthalmus due in part to widening of the fissure and in part to engorgement of the retrobulbar orbital tissues. The pupils were partially dilated and reacted sluggishly to light. The irides were blue, but that of the right eye was less brilliant and had a somewhat yellowish tint, probably the result of irritation, as there was in this eye slight pericorneal injection. In the right eye no ophthalmoscopic examination was possible, as on the temporal side only a faint reddish glare could be obtained, and everywhere else but a brown reflex. In the left eye all of the arteries except the superior and inferior branch, for a short distance, had completely disappeared. The veins had enormously developed and coursed with extreme tortuosity as large black bands. In the entire retina every venous twig was visible because of its distention. In their course was found knots and pouch-like ectasias. Round, striated and splotched hemorrhages were everywhere visible. The changes were active and the white, scattered retinal spots of atrophy showed that they had long been in progress. The papilla had lost its normal color and its edges were invisible. Its position was indicated by the prominence of the vascular trunks. The macular region was beset with hemorrhages. The surface of the retina was as if covered by a fine grey veil, probably the result of connective tissue proliferation. The retina was seen with a +7 D.

Ten days after this examination the iris tissue of the right eye underwent a sudden change in color, from blue to chestnut-brown, accompanied by signs of iritis, but the pupil dilated fully without leaving pigment on the lens capsule. Five days later similar changes occurred in the left eye. The binocular loup showed enormous distention of the blood vessels of the iris. The swollen and tortuous vessels formed a pupillary and a ciliary network, which projected from the surface of the iris like a blood sponge. The color of the vessels (which were apparently veins) was a deep brown.

As the author's conclusions contain the pathologic anatomy in general, no detailed account will here be given.

Conclusions.—In patients suffering from congenital general cyanosis there is observed at times an ocular complication known as *cyanosis retinæ.* This term, which seems sufficient for cases of slight or moderate intensity, is incomplete for severe cases, which are better described by the term *cyanosis oculi.*

In simple cyanosis retinæ, which is compatible with normal visual function, there is observed, ophthalmoscopically, besides the brown coloration of the vessels, a distention of both the veins and of the arteries. The explanation of this phenomenon is that in mild general cyanosis the blood does not contain sufficient carbonic acid gas to strongly stimulate the vasomotor constriction centre, and this leads through moderate stimulation to constriction of the visceral vessels, thereby forcing the blood into other organs and there among the retina, causing dilatation of its vessels.

In severe cases of general cyanosis the ocular fundus picture completely changes. The blood, overcharged with acid, produces marked stimulation of the medullary centres, and produces much more intense and more general vasomotor constriction, including the retinal arteries. In the ophthalmoscopic examination one sees, in fact, the veins greatly distended, and the arteries, on the contrary, unusually constricted, indeed in some places they have apparently disappeared. The constriction of the arteries leads to an intense venous stasis, and upon this follows diffuse apoplexies, venous and arterial thromboses, and also diffuse intraocular hemorrhages, which finally call attention to the eyegrounds. The visual function is, in these cases, rapidly and completely destroyed from the beginning of the attack.

The iris is, because of the arterial spasm, the seat of a colossal venous stasis and, because it is changed into an actual blood sponge, alters its color, so that if it were originally blue it becomes a chestnut brown.

The irido-corneal angle is the seat of a slow inflammatory process which leads to its obliteration and to a glaucomatous condition, which may reach such a high grade that it causes rupture and subsequent atrophy of the globe. This union of intense and incurable changes of the entire eye produces a clinical picture which may well be termed *cyanosis oculi,* the one cause of which is an intense arterial spasm excited by carbonic acid stimulation of the medullary centre. Such vessel changes have the heretofore unknown characteristic that they produce a constriction and also obliteration of the lumen of the vessels, not through the usual process of endarteritis, but by a primary contraction of the muscle coat, which later, as the result of a hypertrophy of its elements, is compensated for. A proliferation of the intima can be observed at most in the final stadium of the disease after thromboses and hemorrhages have occurred. W. Z.

PATHOLOGICO-ANATOMICAL CONTRIBUTION TO OUR KNOWLEDGE OF CONGENITAL COLOBOMATA OF THE EYE.—SEEFELDER, Leipzig (*Graefe's Arch.*, lxviii, H. iii, May 19, 1908). The author says that notwithstanding numerous excellent anatomical investigations there is no unanimity in opinion as to the origin of other than typical colobomata. His conclusions based upon the histologic study of the following cases are appended:

Case 1.—Atypical coloboma O. S. Congenital Cataract Ou.

Case 2.—Coloboma of the iris, ciliary body and chorioid; (typical).

Case 3.—Coloboma of the iris, choroid, optic nerve and optic nerve entrance.

Case 4.—Microphthalmus with orbital palpebral cyst O. S.

Conclusions. Typical coloboma to and those closely related with cyst formation are caused by a disturbance in the closure of the fetal cleft through abnormally long persistent mesoderm.

The vessels of the mesoderm which interferes with closure of the ocular cleft play a part equally as important as the connective tissue of the mesoderm. The fact that there has been an interference with normal closure is plainly expressed in the reduplication of the retina at the mesodermal crest as well as at more removed localities.

The abnormal folding of the epithelium of the pars plan corporis ciliaris as well as the abnormally large size of the ciliary processes in colobomatous eyes is due to the same cause as the retinal foldings.

That a union of the folds of the retina can take place at any time, and that without the disappearance of the mesodermal obstruction demonstrates that the absence of a defect in the retina is not opposed to the above theory of the genesis of colobomata.

For the origin of a large clinical total coloboma it is not necessary that there should be present a persistent mesodermal crest. several irregularly disposed obstructions may interfere with the normal closure of the ocular cleft throughout its entire extent.

The typical iris coloboma originates in the same manner as all typical colobomata through the persistence of the closure of the secondary optic vesicle. and moreover the most peripherally lying portion of the rim of the optic.

A portion of the rim of the optic vesicle to the anterior capsule of the lens does not take place at any time of fetal life. The diameter of the pupil continuously increases up to the eighth month. The fairly constant period of rapid contraction of the pupil is probably due to the action of the sphincter. which takes place upon the absorption of the pupillary membrane.

The shining white or greenish cord-like and utricular formations which extend from the papilla forward in the direction of the posterior pole of the lens and ensheath entirely or in part the arteria hyaloidæ are usually the consequence of an abnormal persistence of the glial sheath which accompanies the vitreous artery.

For some of the atypical colobomata which cannot be traced back to a connection with the cleft. Elschnig's theory that every part of the secondary optic vessels may in embryonal life take an abnormal direction is up to the present the best explanation.

The primary cause of complete absence of the papilla which has at times been noted in high degrees of malformation, and more frequently in the eyes of brainless aborted fetuses. is a failure of development of the optic nerve fibers, whereby an abnormal closeness and smoothness of the union of the two leaves of the secondary optic vesicle at the boundary of the optic and bulbar rudiments takes place. W. Z.

THE ADVANTAGE OF PARAFFIN AS AN EMBEDDING MATERIAL IN EYE PATHOLOGY.—POLLOCK, W. B. INGLIS, Glasgow (*The Ophthalmic Review*, September, 1908). The writer discusses the advantages of paraffin as compared to celloidin in the preparation of an eye for microscopical examination, as follows:

1. Paraffin holds all the parts together so that there is no fear of getting them disturbed after cutting, just as celloidin does. The method of fixing is, however, important, for if the lens and sclera are rendered too hard and brittle it may be impossible to obtain good sections. If the examination in the lens in patients over 30 is not important, the writer removes the portion in the half eye used for sections in order to save the edge of the razors. If the eye is kept too long in the paraffin bath a certain amount of distortion may occur. With regard to sections "being disturbed after cutting," this is largely a matter of technique and gentleness of touch; but a method of avoiding all risk is described.

2. The removal of the paraffin from the sections takes scarcely more than three minutes, and as it is done by placing the slide with section in a tube of xylol, no trouble is entailed.

3. The manipulation of cut sections is a simple matter, even when they curl up.

4. Paraffin sections can be kept for an indefinite time between layers of paper, and paraffin blocks are more easily stored in permanent form than celloidin.

5. Paraffin sections may be cut of extreme thinness.

6. Paraffin is unsurpassed by any other method for obtaining serial sections.

7. The writer then describes his method of precedure which has given him the greatest satisfaction, describing the fixing, staining, cutting and mounting of sections and the method of preserving half eyes. C. H. M.

## PHYSIOLOGY.

A METHOD OF MIXING PURE LIGHTS FOR PHYSIOLOGICAL EXPERIMENTS.—VON KRIES, J. (From the physiological institute in the University of Freiburg i. B., *Zeitschrift fuer Sinnesphysiologie*, 43, 1 and 2, 1908, p. 58), describes his apparatus, on the order of a spectral apparatus, in which two spectra are obtained by two separate sources of light in a much simpler way than by a double refracting Iceland spar in von Helmholtz's instrument. It also allows to ascertain the quantitative proportions of the lights and to read off directly their wave lengths. By an additional arrangement it can also be used for color equations. Then von

Kries gives a few examples to show for what purposes the apparatus is used, the chief one of which is to ascertain complimentary pairs of colors. The details must be read in the original.

C. Z.

THE QUESTION OF CYCLOPIA, ONE-EYED MONSTERS.—STOCKARD, C. R., Woods Hole, Mass. (*Science,* Oct. 2, 1908). The author describes his experiments in producing one-eyed fish embryos, and compares them with mammalian cyclopean monsters. He says: "These embryos throw interesting light on the development of the crystalline lens. In many of them a lens forms from the ectoderm and differentiates independently of the influence of an optic cup. Some embryos with one lateral eye and the other wanting have a perfect lens on the eyeless side. The lens lies freely in mesenchymous tissue, and is disconnected entirely from any portion of the central nervous system." He concludes, that "experiments now show that cyclopean fish embryos may be produced by the action of two salts of magnesium in seawater solutions. The embryos exhibit various conditions of the cyclopean defect from the earliest appearance of the optic vesicles. Cyclopia is *not* due to a subsequent union or fusion of the two eye elements after their free and distinct origin." M. D. S.

EYES AND VISION FROM WORM TO MAN.—AYERS, EDWARD A. (*Harper's Monthly Magazine,* September, 1908). The writer states many interesting facts interspersed with metaphor and simile. The first eye apparatus consisted of a bit of pigment attached to a sight sensitive nerve. He describes the transition from this to eyes having a lens, retina and an optic nerve, and mentions those with or without lids, corneæ, tears, focal adjustment muscles; eyeballs fixed or movable; pupils round, elliptical, angular; irides of many colors; eyeballs encased in opaque pigment—the chorioid, or without it—as in albinos, corneæ hard as horn, or soft; lenses that can be adjusted by drawing them backward; unit and multiple unit—or "compound" eyes; rudimentary eyes; eyes giving inverted or non-inverted images; eyes placed in the middle, at the sides, underneath the head, in the ends of the horns, in the tentacles, or feet, or even on the tail. Some consist of one set of eyes for short work, and another set for far sight. The inner chamber of the eye lying behind the lens is in many animals lined with a membrane not possessed by man, called the tapetum (tapestry), which gives a highly lustrous metallic reflection, greatly differing in various animals. Between tapetum and retina the animal eyes reflect all the colors found in an artist's paint box. Much space is given to describing the possibilities of the visual sense in man. M. D. S.

CONCERNING PHOSPHENES.—OHLEMANN, Wiesbaden (*Wochensch. f. Ther. u. Hyg. des Aug.*, June 25, 1908). By phosphenes is understood intraocular light phenomena. It is usually ascribed to irritation of the retina from pressure upon the globe. Ovio has recently enumerated several causes. Pressure on the globe, movement of the globe, respiratory movements, accommodation, internal causes as scotoma scintillans. Accommodative phosphenes are only noticed in myopic eyes. How it is not known, but that it is due to tension of the zonula (Czermac) is uncertain, because we do not know positively that such an effect is produced by the accommodative act. Berlin believes that they are due to drag upon the retina in the vicinity of the optic nerve. It is difficult to understand how the accommodative act could affect a point so distant. In the discussion Basline spoke of a pulsating phosphene described by him which could be explained only by pressure of the distended vessels upon the elements of the retina. Ohlemann describes a phosphene, not pulsating, but circular, occurring in Basedow's disease, probably occurring in other forms of exophthalmus. It appears at the height of the exophthalmos when pressure and tension are highest. It is seen only in the dark, especially when the eyes are repeatedly opened and shut. It has the form of a corona radiating like the folds of the ciliary processes. It is probably due to mechanical irritation of the light percipient elements of the retinas through retrobulbar pressure. W. Z.

INVESTIGATIONS ON THE PHYSIOLOGY AND PATHOLOGY OF THE PUPILLARY MOVEMENTS.—HESS, C., Wuerzburg (*Archiv fuer Augenhielkunde,* 60, 4, 1908, p. 327). The object of Hess' investigations was to establish the, so far lacking, physiologic basis of the pupillomotor phenomena, which, of course, is indispensable for a further development of their pathology. They are a continuation of his researches on the pupillomotor area (reviewed in OPHTHALMOLOGY, IV, p. 550). Hess once more emphasizes that his results described in his former paper hold good only for the intensities of light which he had employed, and must not be generalized as if the periphery of the retina was not at all responsive even to light of much greater intensity. As formerly, Hess also here invented the methods and apparatuses for his researches, which are described in detail.

We can give only a few of the results. In the light—respectively briefly dark—adapted eye. the retina at a distance of 0.3 to 0.4 mm. from the centre of the fovea in the horizontal and vertical diameters is less sensitive to lights of greater intensity than the centre itself. The motor sensitiveness of the retina decreases more rapidly toward the temporal than toward the nasal sides. The line connecting the points of equal relative motor excitability of the retina forms a curve similar to the curves of the limits of color perception, not a concentric circle. For very intense lights, within certain limits, the motor sensitive area is greater than that for less intense lights. The retinal portions around the optic disc are not noticeably motor sensitive for the lights employed in these experiments. With regard to the motor excitability of the foveal portion of the retina in different states of adaptation, Hess found that two colored lights, isokinetic for extrafoveal portions, close to the color perceiving area without rods, are heterokinetic in the dark adapted eye, i. e., green or blue lights are motorically more effectual than red lights. The foveal area, devoid of rods, has a marked motor dark adaptation.

For ascertaining pupillary reaction in central scotoma and amaurosis. Hess shows that such examinations have only value, if the optical and the motor functions are treated under exactly equal conditions, viz., equal intensity of light, distance, impinging angle and state of adaptation.

As the methods of testing so called hemiopic pupillary reaction, so far in use, are inadequate, Hess devised an apparatus which allows of accurate measurements, and describes it in detail.

There seems no doubt that also in man the outer parts of the visual epithelia are the motor receivers. Hess considers it most probable that the pupillary and optical impulses are conveyed, not by separate, but the same nerve fibers which, further on, branch off into entirely different centers. A schematic plate illustrates the different possibilities of the optical and motor conductions.

C. Z.

THE AMOUNT OF FLUID IN THE HEALTHY AND DISEASED CONJUNCTIVAL SAC.—SCHIRMER (*Wiener Medizinische Wochenschrift,* May 16. 1908). There is a greater production of fluid in the conjunctival sac than there is lost by evaporation. In a normal individual when he is awake 0.5-0.75 gm. of tears are produced in 16 hours, of which 0.27 gms. evaporate; 0.003 gms. of tears are pressed through the tear duct into the nose. During sleep the lacrimal gland does not secrete, and the circulation through the lacrimal duct ceases. After extirpation of both lacrimal glands the conjunctiva does not become dry, because the conjunctiva itself produces as much fluid as it loses by evaporation. The eye thus remains in just as moist a condition as normally, and only during crying does the one eye become drier than the other.

Lacrimation in facial paralysis can be explained by the fact that the Horner's portion of the orbicularis cannot contract: nictitation and with this aspiration through the lacrimal sac ceases, and the tears are not led into the nose. J. G.

## REFRACTION AND ACCOMMODATION.

Vision and Refraction in Their Relation to the General Health, With an Improved Test Chart.—Schulin, Dr. Carl, Billings, Mont. (Essay published by author, 1908). Schulin has for years studied the relation of errors of refraction to the general health. He tested and recorded the eyes of thousands of people, patients as well as healthy ones, at the same time looking into their general health. Whenever possible he retested them from time to time, compared the results and observed them for over ten years. He satisfied himself that no error of refraction can make a healthy person sick: it only aggravates the suffering when people become sick from other causes. Glasses are a great adjuvant in the treatment, but do not essentially produce the cure.

The now so generally accepted theory of the harmfulness of errors of refraction, especially hypermetropia and astigmatism. Schulin dates back to Donder's sentence, "Asthenopia is a definite degree of hypermetropia," which he pronounces a mistake. Like Hartridge he found asthenopia equally as often in people without as with hypermetropia. Besides, he met many people with all kinds of errors of refraction, especially high-grade hypermetropia and astigmatism, who were free from any suffering. And he saw many people with errors of refraction who at times, when their health was poor, suffered and were greatly relieved by their glasses, while at other times, when their health was good, they did not need them at all. The cause of asthenopia he finds in autointoxication, a cause frequently overlooked by "refractionists," and to which he calls the attention of the special profession in a most positive manner.

Schulin tested the refraction with Parent's ophthalmoscope, and the vision with the chart: first, both eyes together and then each one singly. He recorded both tests together with notes on the health of the examined, and his in this way obtained lists show many interesting, hitherto overlooked points.

When using charts from different authors, Schulin noticed that the sizes of their letters do not exactly tally, and are nowhere stated together with the corresponding vision. The time-honored, most widely, but not generally, used and certainly nowhere officially and formally adopted and as standard accepted Snellen chart he found especially unfit for his work, because to test the acuity of the vision with it the distance of the examined from it must be constantly changed. Therefore he decided to draw a chart of his own. Disregarding Donder's visual angle of one minute for the thickness of the lines of the letters, and five minutes for their whole size, whereupon Snellen based his chart, Schulin drew letters closely approximating the sizes of the Snellen letters, but for easy gradation, adapted to the use in this country, adopted lineal measure.

Donder's named as starting point of the scale of vision the fraction 20/XX=1 as full vision under an angle of one minute, although he knew that many eyes can see under a smaller angle. Snellen based his chart upon Donder's standard and graduated it up to 20/CC. In this country's lineal measure Snellen's 20/CC letters have a size of very close to 3.5 in.=56/16, exactly 55.850/16, and the 20/XX letters one of 7/XX=5.6/16. For the practical purpose of easier gradation Schulin arbitrarily changed 7/XX to 5/16, and drew his own rows after Snellen's principle. Schulin states on his chart the exact sizes of his letters and the corresponding vision when looked at from a distance of 20 feet.

Schulin's 20/CC letters are only 3 inches high, his 20/XX, 5/16 of an inch and are an arbitrary standard—certainly not based upon a 20/XX=1=full vision under angle of one minute, i. e., *not* based upon Donder's or Snellen's measure.

No doubt the errors of refraction can be corrected with lenses with such a chart, but its departure from the standard may debar its general use. It is true that letters on charts differ, even those printed from the same plate, due to influence of humidity, the manner of printing and inaccuracies of drawing. No matter how careful the author of a set of test letters may be with the first plates made under his immediate supervision, the manufacturer sooner or later becomes negligent, and his output of test types departs from the original standard. Part of these defects are certainly remedied by printing the test types on porcelain plates, and if these are transilluminated the standard of size and illumination remains uniform. H. V. W.

The Eyes of School Children.—Carhart, W. M. (*Am. Jour. of Obstets.*, July, 1908). The author's résumé is as follows:

1. The increase during late years in the number of children wearing glasses is due not to an increase in the number of weak or diseased eyes, so much as to the greater strain on the function of vision necessitated by our more extended use of the eyes for close work in the complex civilization of the present day.

2. The normal child is born hypermetropic and without astigmatism. The myopic child is either defective from birth or has acquired myopia from the stress of eyestrain through the "turnstile of astigmatism." Astigmatism is not congenital, but is practically always acquired in the normal child during the early years of life by excessive strain on the muscles of accommodation.

3. Kindergarten and primary work should be so arranged as to avoid strain on the muscles of accommodation of the eye, in the plastic years of childhood. Hence, sewing and all weaving exercises should be limited in amount, if not absolutely eliminated.

4. Systematic study should be begun only when the delicate and soft tissues of the child's eyes have attained sufficient formation to resist distortion on moderate use of the accommodation. This means, that the prolonged close work should not be allowed until the age of 10 or over. A child beginning systematic study at that age will, with suitable care, be able at 16 or 18 to acquire all the knowledge possible to its more precocious companion, and will have the inestimable advantages of normal eyes and healthy physique.

5. No young child should be encouraged to compete with its companions for prizes. Mental and ocular overstrain are the inevitable results of such educational monstrosities. In the primary schools especially there should be no grading of the children.

6. A child incapable of the prolonged use of the eyes at the proper age should not be classed as culpably lazy. In the majority of cases there will be found uncorrected refractive error.

7. Inability to concentrate the mental attention and deficient powers of observation are often caused by bad visual memory resulting from eyestrain.

8. The symptoms and physical signs of eyestrain in children can be easily recognized, and there is no more brilliant success

in medicine than that which follows the correction in children of refractive overstrain. H. V. W.

ANISOMETROPIA.—BRUNER, WILLIAM EVANS, Cleveland (*Ohio State Medical Journal,* Aug. 15, 1908). Donders and Fraenkel are quoted in showing that asymmetry between the orbits or between the two sides of the head and anisocoria have no relation to anisometropia. This condition is usually congenital. The writer discusses three groups of anisometropic cases: Where binocular vision can be obtained both eyes are corrected. and, if advisable, this is done in other cases. Failure sometimes results, as in neurasthentic patients. Other causes of asthenopia should be looked for, e. g., nares or sinus conditions, gastro-intestinal or uterine troubles. Any type of muscular imbalance may be found in anisometropia and a combination of a vertical and horizontal muscle is very frequently found. Duane thinks that the disparity between the retinal images furnishes one of the main reasons for prescribing glasses, rather than a contraindication as some writers say. A real difficulty is the prismatic effect from the lenses, which may cause muscular asthenopia or even diplopia. The glasses must be centered with great care and two pairs, one for distance and one for prolonged reading, even though alike may sometimes be advisable. When a convex lens is placed before one eye and a concave before the other. and the ordinary segments placed upon these: on account of the location of the segments, there will be in the former lens the effect of prism base up and through the concave lens the effect of prism base down, with a resultant total vertical prismatic effect which will be most distressing to the patient and render the use of the glasses impossible. This can, however, be corrected by combining vertical prisms with the segments, base down in the segments for the convex lens, and base up for the other segment, so as to bring the images as seen through the reading portions exactly on a line. This difficulty can be readily overcome by the old perfection bifocals. The lenses must be worn as close to the eyes as possible. Duane points out that the patient may find difficulty on wearing glasses because they are strong or contain strong cylinders, or if muscular deviation is present, especially if diplopia exists enchancing the distinctiveness of the two images, make matters worse. In anisometropia the writer uses a mydriatic even at an eye when not otherwise necessary, and always makes a post mydriatic measurement, except in small children. It is sometimes better not to correct the astigmatism fully at the start. He believes that the question of the so-called dominant eye may be as Gould suggests important in this condition. Muscular imbalance will in some cases disappear after wearing correction for a time, though in others it is but to give a partial correction and remove prism later if necessary. Ocular gymnastics are sometimes beneficial; rarely operation is necessary. The author gives statistics of results and records a few cases. M. D. S.

MENTAL AND OCULAR OVERSTRAIN IN THE EDUCATION OF CHILDREN.—CARHART, WM. M., New York (*Med. Rev. of Rev.*, September, 1908). The writer concludes an article on this subject with the following list of suggestions made by the Association of Woman Principals of the Public Schools of New York, with the advice of a number of oculists, to the Board of Education:

"1. That hereafter no calendared or coated paper be permitted in the text-books given to children, as the dazzle of such paper is injurious to their eyes. 2. That half-tone pictures be not permitted in school books, but that simple, easily seen outline pictures be substituted for them. 3. That the length of lines in school books be of a minimum of two and one-half inches to a maximum of three inches, with a space between the lines of not less than 3 mm. 4. That in reading the child be advised to hold his book at an angle of approximately 45 degrees, and that in oral reading they be required to look up frequently. 5. That after a lesson demanding close work the children be asked to look up at the ceiling or out of the window to change the focus of their eyes and rest the muscles of accommodation. 6. That class rooms be equipped with loose chairs of different sizes so that the children may sit in seats that fit them and placed where they can see best. 7. That in the first two years of school all writing be upon blackboards instead of upon paper. 8. That all rooms where artificial light is burned continually be closed; that no part-time classes be permitted to occupy any room in which the light is not entirely satisfactory. 9. All electric light bulbs used in lighting class rooms to be made of frosted glass, and that clusters of such bulbs be provided with pale amber shades to screen the pupils' eyes from the direct rays of the light. These recommendations have not yet been acted upon by the Board of Education of New York City, but they are being carefully considered, and probably will, with modifications, be adopted. If they are put in force in the near future a very great advance will be made in the precautions surrounding school life in New

York City, and children's eyes will be in the future much safer from damage than they have been up to the present time.

C. H. M.

Brief Report of a Case of Hallucination and Other Nervous Symptoms Coincident With Astigmatism Seen and Corrected Ten Years Previously.—Fernandes, Juan Santos, Havana, Cuba (*Ophthalmic Record,* September, 1908). The patient suffered from migraine and epilepsy. The attacks of epilepsy were preceded by an aura visual in character and consisting of a gladiatorial dwarf who rapidly approached from a distance, increased in size and felled the patient to the ground. Dr. Chas. A. Oliver had prescribed lenses for the correction of myopia and astigmatism, and whose findings were verified by the author. Ten years have passed since then, and the patient has been relieved of his hallucinations. M. B.

## RETINA.

Cyanosis Retinæ.—Tyson, Henry H., New York (*Arch. Ophthal.,* New York, September, 1908, xxxvii, 555), gives a brief review of the etiology and pathology of general cyanosis due to congenital cardiac disease, and details a case of cyanosis retinæ occurring in a patient aged 12 years, in which a diagnosis of congenital patent, foramen ovale with pulmonary stenosis was made.

W. R. M.

Postcript to v. Hippel's Article on Retinal Detachment.—v. Hippel, Heidelberg (*Graef's Arch.,* lxviii. H. ii, May 17, 1908), sought to determine experimentally whether a vitreous of the consistence of albumin, which, in life, completely filled the bulbar cavity, could in hardening in Müller's fluid by expression of the albuminous fluid be drawn together into the anterior portion of the cavity. The experiments were made with fresh pigs' eyes; the sclera was dissected off sparing the other coats. This was not always faultlessly accomplished. Small defects in the chorioid and retina, however, could have no significance. They were placed in fresh blood serum, and after strewing the surface with thymol powder they were placed in a cool place for four days. No putrefaction occurred. They were then put into Müller's fluid for three to four weeks. In both eyes it was found that the uniformly coagulated vitreous filled the space between the lens and retina, and in neither case was the retina dragged forward, and an albuminous coagulated fluid layer found between the vitreous and retina. W. Z.

ON RETINITIS PIGMENTOSA.—GINSBERG, S., Berlin (*Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 11, 1908, p. 1), reports a case of retinitis pigmentosa in a man aged 25, with V. R. 5/xxx, L. 5/xv. After ten years he could see only large objects and had intense hemeralopia, both discs were pale and indistinct; there was posterior polar cataract and a grayish blue cystiform formation in the vitreous of right eye.

The patient died from tuberculous broncho-pneumonia. Ginsberg examined the eyes anatomically and gives an exhaustive histologic description: The greatest changes were found in the retina are found over large areas of normal chorioid: also at the tem. was intact, excepting an unequal infiltration of the chorioid, near the disc, with mononuclear round cells and epithelioid cells, which Ginsberg considered as an expression of tubercular inflammation. In one eye a cheesy tubercle, with giant cells and tubercle bacilli, was found at the nasal side of the disc. The macula of one eye presented, probably as complication, a typical hole, a condition which so far had not been seen in retinitis pigmentosa.

The author summarizes as follows: As there is absolutely no relation in the localization and intensity between the changes of the retina and chorioid, and the most intense alterations of the retina are found over large areas of normal chorioid; also at the equator, a disturbance of circulation in the chorioid cannot be considered as cause, especially because the neuro-epithelium usually remains intact in much more extensive atrophy of the capillaries (e. g., nephritis, old glaucoma, etc.). As the neuro-epithelium was changed to a large extent, the primary affection must be sought here. Probably there was an insufficient development of the neuro-epithelium so that it did not answer the functional requirements and was gradually destroyed. C. Z.

ARTERIO-VENOUS ANEURYSMAL DILATATIONS OF THE RETINA, IN CONNECTION WITH LESIONS PROBABLY TUBERCULAR.—TERSON (*Annales d'Oculistique,* May, 1908), reports the following case: A young girl of 26 years, the subject of frequent attacks of bronchitis and with a decided tuberculous inheritance, had lost all vision in the right eye in consequence of detachment of the retina following a chronic irido-chorioiditis.

In the left eye vision equalled one-half. The ophthalmoscope showed extensive aneurysmal dilatation of the inferior retinal artery and vein. There were beaded swellings in the artery, while the vein was uniformly dilated and tortuous. The vein was lost below in a lesion of circular form and twice the diameter of the papilla in size. Its borders were sharply defined and raised. The grayish color of the retina about this focus suggested a chorioidal coloboma or a rent in the retina formed by a neoplasm. On the opposite side of this lesion the vein reappeared, with the same enormous dilatation, and was connected with a dilated artery.

In view of the fact that Krauss and Bruckner found that injections of tuberculin caused an increase of retinal hemorrhage, the author did not consider it prudent to apply the tuberculin test, but thought it almost certain that the lesions were of tubercular origin. He thinks also that this was true of a number of other cases reported in literature, and concludes that when such a lesion is found in a young subject the treatment appropriate to tuberculosis should be applied. G. C. H.

Retinal Degeneration, Typical Pigment Degeneration of the Retina and Idiocy in Several Members of the Same Family.—Stock (*Wiener Medizinische Wochenschrift,* Aug. 22, 1908). Four children of parents with no consanguinal relation were affected with the above mentioned condition. These children were well up to the sixth year, but died idiotic and blind.

This form of affection was quite different from the Sachs' family idiocy where the mental condition was congenital; the characteristic feature in these cases was that the retinal and brain affections set in at the time of the second dentition, and the course of the affection was a slow one.

In these cases, however, the idiocy was not accompanied by paralysis, and there existed retinitis pigmentosa without atrophy of the optic nerve. J. G.

## SINUSES AND NOSE.

Treatment of Orbital Abscess Due to Fronto-ethmoidal Sinusitis.—Fromaget (*Annales d'Oculistique,* June, 1908), insists upon the danger not only to vision but to life of these sinusites and upon the necessity of radical operation, including a thorough curetting of the sinuses and free drainage into the nasal cavity. G. C. H.

Disease of the Accessory Sinuses as a Cause of Inflammations of the Eye and Paralyses of the Ocular Muscles. —Shoemaker, J. F., St. Louis, Mo. (*Amer. Journ. Ophthalmology,* July, 1908). The writer believes that notwithstanding the abundance of articles written in this country and in Europe during the past few years setting forth the close relations between disease of these sinuses and affections of the eye, many ophthalmologists do not think of sinus diseases as a cause of inflammations of the eye and of muscular disturbances as frequently as it would be well to do.

He considers the anatomical relations of the accessory sinuses to the eye, quotes Onodi on this subject, and discusses the exact manner in which the ocular disturbance is brought about.

He gives Fish's well-known views on the subject, gives examples of uveitis, iritis, chorioiditis, due to sinus disease, and describes a case of his own in which chorioiditis was due to maxillary sinus disease, and another in which unilateral headache was caused by frontal sinusitis.

Next he reviews affections of the retina and optic nerve dependent upon sinus disease; also paralysis and paresis of the ocular muscles due to the same cause, giving the histories of two patients in whom sinus disease was responsible for ocular pareses.

He concludes with the following concerning the diagnosis of sinusitis: "In order to make a diagnosis of sinusitis it has been thought by some that two symptoms were necessarily present, viz., pain and purulent secretion in the nose. Pain is very likely to be present in the 'closed sinusitis,' that is, where the secretion of the sinuses does not drain away on account of the natural openings being occluded. It is this form that is particularly liable to produce eye complications, and while there is usually more or less pain present, it is often mild and in some cases entirely wanting. On the other hand it is precisely this class of cases that do not have much, if any, secretion in the nares, because it cannot escape from the sinuses through the closed openings. Where there is a good deal of purulent secretion in the nares, it is proof that the cavities are draining well and hence not so likely to produce complications. Engorgement of the turbinates, both middle and inferior, is very suggestive of sinusitis. Three important symptoms of 'closed sinusitis' are dizziness, pain, either dull or severe, and nasal congestion." C. H. M.

The Relation of Disease of the Nasal Accessory Sinuses to Diseases of the Eye.—Mackay, George. Edinburgh (*The Lancet,* Aug. 8, 1908). The writer divided these diseases clinically into the following groups: 1. Mucoceles of the accessory sinuses. 2. Sinusitis, acute or chronic, accompanied by obvious external signs of orbital cellulitis, abscess formation, tumor growth, oedema of lids, or apparent dacryocystitis. 3. Sinusitis without external signs of inflammation in the orbit or neighboring tissues, but (a) with ophthalmoscopic signs, such as optic neuritis, neuro-retinitis, retinal thrombosis, or phlebitis, etc., and (b) without ophthalmoscopic signs, but with disturbances of vision, such as central scotoma or limitations of the field of vision, paralyses of ocular muscles, or disturbances referable to the fifth nerve. 4. Cases in which the association with sinus disease has been asserted, but is more questionable, such as glaucoma, iritis, uveitis, keratitis, opacities of the lens and vitreous, etc.

He emphasized the necessity of studying the paths by which inflammation or neoplasms spread from the sinuses into the orbit as influencing appropriate surgical treatment; the subperiosteal operation was to be preferred when possible; he invited discussion as to the means of differentiating between orbital cellulitis due to sinus disease and other causes such as syphilitic or tuberculous periostitis, and finally he commented upon the difficulty of recognizing the presence of empyema in the absence of nasal symptoms or of obvious orbital mischief. C. H. M.

THE RELATION OF DISEASE OF THE NASAL ACCESSORY SINUSES TO DISEASE OF THE EYE.—TURNER, A. LOGAN, Edinburgh (*The Lancet,* Aug. 8, 1908). The writer divides the large air spaces surrounding the orbit into two groups, an anterior and a posterior, a subdivision useful both clinically and anatomically; the anterior group comprises the frontal and anterior ethmoid cells and antrum, and these have orifices into the middle meatus of the nose; the posterior ethmoidal and sphenoid cells empty into the superior meatus. Disease of the anterior group affects the eye directly by compression and displacement. The posterior group is closely related to the optic and oculomotor nerves, being separated by the thinnest bony septa, in some cases incomplete, and then the partition consists merely of thin layers of lining membranes.

The difficulty in exact diagnosis of the site of lesions is the irregularity of the position and relation of the cells, both to the median line and to the roof and floor of the orbit; this necessitates a constant alertness in operation, since the unexpected is constantly cropping up.

The venous distribution is of great importance; all the air spaces have venous return, which passes into the orbit and thence by the ophthalmic vein into the cavenous sinus. C. H. M.

THE RELATION OF DISEASE OF THE NASAL ACCESSORY SINUSES TO DISEASES OF THE EYE.—AXENFELD, PROF., Freiburg, Germany (*The Lancet,* Aug. 8, 1908). Professor Axenfeld calls attention to the fact that transient attacks of inflammation of the lining membranes of the posterior cells may be frequently accountable for retrobulbar neuritis, even though there is no closure or empyema of these cells. This is probably due to the frequent deficiency of the bony walls of the groove in which lies the optic nerve. It is notorious how frequently it is asserted that chills had marked the onset of attacks of retrobulbar neuritis, and he thinks that affection of the air cells is the connecting link. On the point of exploration and draining of affected air cells in case of eye disease, he thinks that the matter is properly within the province of the ophthalmic surgeon, and that he should be prepared to examine the nose thoroughly in any suspicious case and treat it himself. The old idea that the field of eye surgery is bounded by the bony walls of the orbit was exploded long ago, in fact, as soon as the eye surgeon adopted Krönlein's operation as being within his particular province. C. H. M.

MIXED STREPTOCOCCUS AND PNEUMOCOCCUS INFECTION OF THE ORBIT AND ADJACENT SINUSES.—BULL, CHARLES STEDMAN, New York (*Annals of Ophthalmology*, October, 1908). The writer calls attention to the increase in frequency and gravity of this form of infection during the last few years, especially in the United States, and to the extraordinary variability in the virulence of action of the germs. During the past winter and spring he has seen a goodly number of cases of severe inflammation of the eye and its adnexa due to mixed infection by the pneumococcus and streptococcus. He gives detailed histories of six examples of such infection.

The points emphasized in the study of these cases are: 1. The marked insidiousness of the attack and the varying duration of the period of incubation. 2. The extreme violence of the symptoms in the sudden onset of the attack. 3. The very rapid rise of temperature and the equally sudden fall after operative interference has opened the purulent deposit. 4. The rapid development and violence of the symptoms point apparently to an unfavorable prognosis. 5. Immediate and active interference with free incisions, through curetting and irrigation, and prolonged and careful hunting for the purulent foci, soon bring about a more favorable condition. 6. The necessity for great vigilance in watching the cases and searching for new foci on any sudden and rapid rise in temperature. 7. The patients were all young, the oldest being 21 years and the youngest 9 months. 8. In only one case was the eye lost from suppuration.

C. H. M.

Ocular Affections Associated With Disease of the Sinuses Contiguous to the Orbit.—Risley, S. D., Philadelphia, Pa. (*Annals of Ophthalmology,* October, 1908). The writer gives the histories of three patients to emphasize the very frequent relation of cause and effect existing between various forms of eye diseases and affections of the bony sinuses.

Case 1 occurred in a man who had been suffering from severe pain in the head aggravated by use of the eyes and often culminating in violent attacks of sick headache; the correction of mixed astigmatism gave relief from his violent attacks, but he was nevertheless unable to use his eyes with comfort. Swollen middle turbinates were cauterized, pressure and obstruction removed, and the eye symptoms disappeared.

Case 2 occurred in a man of 42, who suffered from failing vision (1/5) and constant frontal headache. Amputation of both middle turbinates was followed by a profuse discharge of pus, and almost instant relief from headache and undue sensibility to light.

Case 3 presented firm blocking of the right upper nasal fossa by hypertrophy of the middle turbinate; purulent inflammation of the right frontal sinus; filtration into right maxillary antrum, necrosis and destruction of the floor of the frontal sinus; abscess of the orbit; proptosis of the eyeball; optic neuritis with reduction of vision to 1/5. Recovery through surgical procedure.

C. H. M.

Abscess in the Zygomatic Fossa.—Foster, M. L., New York (*Ann. Ophthal.,* July, 1908). A woman of 55 awoke one morning with pain of left cheek, some swelling of the side of the face and congestion of the eyeball. Inability to open mouth and exophthalmos rapidly developed. Decayed teeth on that side. Incising gums finally evacuated pus, but with no relief to symptoms. Orbital incisions finally evacuated pus, with no relief of symptoms. The process extended over a long period, during which repeated orbital incisions and explorations were made, eventuating in the diagnosis of extension of a zygomatic abscess into the orbit by way of the sphenomaxillary fissure. Recovery finally took place, but the eye had been rendered sightless from optic atrophy.

M. B.

## SYMPATHETIC OPHTHALMITIS.

Clinical and Therapeutic Considerations Upon Sympathetic Ophthalmia.—Abadie (*Annales d'Oculistique,* June, 1908). If the traumatism has destroyed all hopes of vision or even of preserving the form of the globe, enucleation is unavoidable. If, on the contrary, the wound is small, if a little vision remains and the form of the globe is preserved in almost normal dimensions, the author maintains that an attempt should be made to save the eye.

He advocates the thorough application of the galvano-cautery to the wound and covering it with conjunctiva. If sympathetic disease should still threaten he has recourse to mercurial inunctions or injections. If the worst comes, enucleation is still available (if not too late).

Even in the presence of declared sympathetic ophthalmia, he does not despair, but cauterizes the wound vigorously and makes deep mercurial injections in the orbit of the injured eye.

G. C. H.

THE TIME FOR ENUCLEATION IN SYMPATHETIC OPHTHALMIA. —VALUDE (*Annales d'Oculistique,* June, 1908) advocates a prudent medium between the abuse of enucleation and the dangerous conservatism which tends to result from the reaction against it. He thinks it good surgery to sacrifice eyes in which vision is manifestly lost, particularly if they contain foreign bodies. It can no longer be denied that when enucleation is performed, even at the earliest appearance of the slightest subjective symptom of sympathetic affection, it may be and nearly always is, already too late.

The only point worthy of discussion now is what procedure it is best to follow in cases in which sympathetic trouble is threatened when the injured eye is still capable of useful vision.

It is not possible, of course, to prescribe a formula for all cases. As Coppez has said: "To enucleate a sympathizing (injured) eye still capable of vision when we are not sure of preserving the vision of the other ("sympathized") is assuming a grave responsibility."

After reporting a case in illustration of the fact that enucleation is of but little benefit when sympathetic ophthalmia is once established, the author concludes that it is better to sacrifice a useless eye before the first signs of sympathetic inflammation appear, when it may be too late, though, even then it is well to enucleate. He believes though that an injured and sympathizing eye still capable of useful vision, should be retained when the other is involved, in view of the uncertain effects of enucleation after sympathetic ophthalmia is once established. G. C. H.

Sympathetic Ophthalmia After Ablation of the Anterior Segment of the Eye.—Trousseau (*Annales d'Oculistique,* July, 1908). A chronic cyclitis had followed an unsuccessful operation for complicated cataract of the right eye two years before the patient was seen by Trousseau, and later an abscission had been performed.

Seven weeks after this last operation the left eye was weak and watering and vision was so much impaired that the patient had difficulty in going about. The eye was congested, there was pericorneal injection, the iris was changed in color and adherent in places, there were points of exudation on the membrane of Descemet, and the vitreous was hazy. The stump of the right eye was injected and tender to pressure.

The stump was enucleated and atropia, mercurial inunction and laxative were ordered. The symptoms improved and the patient was finally discharged with vision equal to one-third.

The author considers it indisputable that when sympathetic ophthalmia has commenced nothing should be done to the sympathizing (injured) eye but to remove it. Any other intervention promotes sympathetic ophthalmia. He has known of cases in which resection of the optic nerve, the use of the galvanocautery, iridectomy, the removal of a foreign body and abscission have had this effect. G. C. H.

## TOXICOLOGY.

Toxic Symptoms Following the Instillation of Homatropin Hydrobromate.—Harris, C. M., Johnstown, Pa. (*Ophthalmic Record,* September, 1908.) A woman aged 35 received four instillations of a one-half of 1 per cent. solution four times during a period of two and one-half hours. Within thirty minutes she begun having symptoms of atropin poisoning of the usual character. She was convalescent about seven hours later.
M. B.

## TRACHOMA.

Preliminary Report of a Theory of the Etiology, Prevention, Pathology, Treatment and Cure of Trachoma.—Eaton, Frank B., Portland, Ore. (*Ophthalmic Record,* September, 1908.) Trachoma is primarily an infection of the blood by organisms. The micro-organisms are protoplasmic bodies. They enter the human vascular circulation through the palpebral conjunctiva. They are of two kinds, exogenous and endogenous. The former enters the conjunctival vessels by the bite of an intermediary host. The exogenous parasite is carried to the conjunctiva through the agency of certain animals and birds whose blood and tissues enable it to complete its life cycle. This parasite is then carried to the human conjunctiva by the legs, bodies, etc., of insects. Only the endogenous parasite is infective from one human being to another. There are two similar but distinct diseases clinically termed trachoma, but which are biologically different. One is contagious, the other is not. The contagious form has as its essential cause the endogenous parasite, and the non-contagious form is caused by the exogenous parasite. The disease should be more prevalent where there are many biting and non-biting insects. There is a cachexia in the individual from blood infection. The prevention, treatment and cure of both forms of the disease should be most successful and prompt by the application of the principles contained in the theory of thyroidase (opsonin). Next come the various forms of constitutional treatments, such as serum antitoxins, etc. When the granulations appear near the surface the usual local remedies may suffice, but when thus apparently cured the disease may recur unless the protoplasmic bodies in the blood are destroyed.

The human body, being the final host, all animals (except perhaps certain monkeys) and birds should be exempt from the disease, and perhaps certain of the human races. M. B.

## TUMORS.

Glioma of the Retina, Enucleation and Recovery.—Schneider, G. J., Elgin, Ill. (*Ophthalmic Record,* August, 1908.) An eye was enucleated in a child of 2 years for glioma of the retina in an early stage. No recurrence after six years.

M. B.

A Case of Dermoid Tumor of the Conjunctiva.—Levitt, Marcus, J., Brooklyn, N. Y. (*N. Y. Med. Jour.*, July 18, 1908.) The writer gives the history and describes a case of dermoid tumor involving the sclerocorneal junction. He gives the references of eleven other examples of this abnormality reported since 1865.

C. H. M.

Calcifying Fibroma of the Orbit.—Roy (*Annales d'Oculistique,* July, 1908). A boy 14 years of age, without syphilitic, tuberculous or other diathesis, three years before he came under observation, complained of pain in the left eye and impairment of vision, and these symptoms were followed by exophthalmos.

A tumor the size of a "nut" was removed from the orbit, and the pain continuing the ball was enucleated. Two years later there were swelling of the orbital tissue and severe pain and headache, and a sanious discharge flowed from the orbit.

A large tumor filled the orbit and extended beyond its upper margin, and when removed was found to consist of a fibroma with numerous small foci of calcification. G. C. H.

Spontaneous Cure of a Tumor Diagnosticated as Sarcoma of the Orbit.—Korter (*Wiener Medizinische Wochenschrift,* July 4, 1908). A 16-year-old patient was suffering from a tumor at the margin of the orbit, which extended to the deeper structures and was accompanied with intense pain. It seemed impossible to extirpate the entire tumor. The anatomical diagnosis was sarcoma.

The patient was treated with iodid of potash for half a year and the tumor had almost all disappeared, but after four years it had entirely disappeared. J. G.

## VISION AND COLOR VISION.

The Visual Defect in Miners' Nystagmus.—Snell, Simeon, Sheffield (*Brit. Med. Jour.,* Aug. 1, 1908). In his Presidential Address, delivered before the annual meeting of the British Medical Association, Snell calls attention to the fact that Sheffield may not inappropriately be called the cradle of the study of industrial diseases, citing Knight's early studies in knife-grinders' phthisis and Hall's work on lead-poisoning, especially among file-cutters. Snell himself has paid particular attention to the eye diseases and injuries connected with Sheffield trades, and mentions:

1. Diseases due to occupations involving prolonged use or excessive strain of the eyes and their muscles, such as nystagmus in coal miners and in other employments.
2. Those due to occupations which involve the use of poisons, such as dinitro benzol, used in making explosives, carbon disulphide, and so on.
3. Effects of exposure to excessive light or heat, as in burnishers, steel smelters, electric welders, bottle-makers, and others.
4. Injuries amongst grinders, iron and steel workers and coal miners.

Snell discusses, in detail, the first group of affections, that of nystagmus in miners, which as he showed long ago is mainly due to the constrained position in which the men work, and resulting strain and exhaustion of the elevator muscles of the eye. Illumination is a secondary factor. Nystagmus is found with all kinds of illumination underground, where electric light and oil lamps affording abundant light are installed, as well as in various occupations above ground, where there is constant strain of the elevator muscles, but ample illumination, either natural or artificial. Snell then takes up a new and important subject in this relation, namely, the effect of nystagmus on vision of miners and the degree to which it may interfere with the recognition of certain visual danger signals commonly used in mines. The detection of fire damp is of vital concern, and the ordinary method is by reducing the size of the oil flame of the safety lamp until the luminosity almost disappears and the fire damp then, if present, appears as a pale blue flame or cap above it, this "cap" being due to the presence of gas in the air, and in size, proportional to its amount. Apparent dancing of the flame of the safety lamp forms a prominent symptom of miners' nystagmus, and Snell has long suspected that this would be a hindrance to the delicate detection of the "cap." He made careful tests of a large number of miners with nystagmus as to their ability to recognize the gas cap over the flame of a safety lamp. The patient was allowed to remain in a perfectly dark room with only a safety lamp as a light. After "getting his sight" by adaptation, a small gas cap was produced and increased until detected. The patients were also made to remain for some time in the constrained position usual during the work of undercutting or holing coal, and then to rise and look at the lamp held above the level of the eyes, as in examining for gas at the level of the roof of the workings. Forty-eight miners from thirteen different collieries were tested. All complained of apparent motion of the lamp, and none could detect a small danger cap. Staggering and dizziness were common symptoms. Vision improved in some cases on steadying the eyes and resting them by turning them directly downwards. The majority could not even see a large cap. A miner with nystagmus cannot be relied on to see the danger signal. The oscillation of the eyeballs makes objects appear to dance, and the rate of motion is proportional to the oscillations. As the latter may be very rapid, up to 350 a minute, the result is a blur. The oscillations may be to and fro, rotatory, or combined. Snell has given a graphic representation of the effect of nystagmus on vision by means of photographs taken with the camera in rapid oscillating motion. The photographic plate was held to represent the oscillating eyeball, and was moved one-half inch each way at the rate of 150 to and fro movements in a minute. The blur of the flame is marked, and even a normal eye finds it almost impossible to detect a delicate gas cap. P. H. F.

COLOR-BLINDNESS.—SPRINGER, J. F. (*Scientific American*, Aug. 15, 1908.) After describing to some extent color-blind and color-weak persons, the writer gives some tabulated results of Prof. Nagel's experiments on some of the latter class, with particular reference to railroad signaling. Prof. Stratton's work along these lines is cited. The green light indicating caution is very susceptible to smoke, making it easily mistaken for white. The red light is produced by placing a red glass in front of a colorless light, which, cutting off all but the red rays, diminishes the intensity of the light. The red should be about one-fifth the intensity of the white light, but it was found by actual tests much weaker. It was found necessary to increase the intensity of the red from fourteen to eighteen times that of the white light to render it visible, and on the average thirty to one is the ratio. A *movement* of light or signal lights depending on their form for their significance is advocated. M. D. S.

## VISUAL FIELD.

VISUAL FIELDS IN PIGMENTARY DEGENERATION OF THE RETINA. —HEPBURN, M. L., London (report of July, 1908, meeting of the Ophth. Soc. of the United Kingdom, *Brit. Med. Jour.*, July 25, 1908). The contribution was based upon 26 cases, which were tested in various ways, owing to the risk of error and the knowledge that much depended on the intelligence of the patient. His chief concern had been to estimate the amount of relatively functioning area remaining—in other words, how much of the retina had escaped destruction in such cases. Unless the rods and cones had been hopelessly damaged, the retention of visual acuity was a matter of degree. Where the patient showed uncertainty, the matter could be placed beyond doubt by stronger illumination. As it was desirable to have a definite standard to work to, he had taken as his standard a 10-millimetre test object in natural light. He pointed out the relationship between the several varieties, and showed slides in illustration. The pathological changes in chronic inflammation of the chorioid were of two kinds, and were represented by two kinds of visual fields. He raised the question whether the islands of vision occasionally seen through scotomata represented portions of retina which had escaped disease, or did they represent the re-establishment of the circulation or a new system of vessels. C. H. M.

## *Book Reviews.*

**Spectacles and Eyeglasses, Their Forms, Mounting and Proper Adjustment.**—PHILLIPS, R. J., M.D., Ophthalmologist Presbyterian Orphanage, late Adjunct Professor of Diseases of the Eye, Philadelphia Polyclinic and College for Graduates in Medicine, etc. Fourth Edition, Revised, with 56 illustrations. Price, $1.00 net. P. Blakiston's Son & Co., Philadelphia, 1908.

This book presents the new ideas in the construction of spectacles, especially in the construction of eyeglasses. The author lays stress on the fact that without the knowledge of the correct placing of the glasses before the eyes the most painstaking measurement of the refraction will frequently fail of practical results.

We can not agree with the author as regards the use of a fused bifocal lens, for in our hands it has proven a great success, and from the standpoint of appearance there is much in favor of the fused bifocal. The cost, which is about twice as much as the cemented, has to be taken into account, especially if the ophthalmologist furnishes the lenses, for he will, unless he is very careful in his refraction, find that it is a failure financially.

In these days of dispensing of glasses by ophthalmologists, as is common in most parts of America, fuller directions and measurements of face for prescription of frames is necessary than is found in this book.

G. I. HOGUE.

**Bacteriology of the Eye.**—AXENFELD, DR. THEODORE, Professor of Ophthalmology in the University of Freiburg. Translated by Angus MacNab, B.A., B.Sc., M.B., Ch.B., F.R.C.S., Chief Clinical Assistant Royal London Ophthalmic Hospital. With 87 illustrations, some of which are colored, and three colored plates. Ballierè, Tindal and Cox, 8 Henrietta Street, Covent Garden, London. Large Octavo. Price, 21 shillings net.

Ophthalmic surgeons have long prided themselves that their specialty was truly scientific, empiricism being under modern methods of diagnosis and treatment practically abolished. Where, however, this latter still remained was in the dealing with the results of bacteriological infection, diagnosis very frequently being made dependent upon the haphazard line of treatment adopted. Particularly so used this to be the case in conjunctival catarrhs. Now, however, with such a work as Axenfeld's on our library shelf to refer to, such unscientific procedure becomes inexcusable, and, on the other hand, a careful examination into the nature of the bacteria will not only greatly benefit their patients but will ascertain facts which will elucidate clinical and therapeutical problems unanswerable in any other manner.

Axenfeld's name alone, from his world-wide reputation, will recommend such a work without the necessity of pointing out that this work is practically unique of its kind and certainly in its arrangement and beautiful illustrations. The work contains nearly 400 pages divided into eleven chapters, under the following headings: I. Remarks on Technic. II. The Normal Conjunctiva. III. The Lids. IV. Wound Infection. V. Conjunctivitis. VI. The Special Forms of Conjunctival Infection. VII. The Lacrimal Apparatus. VIII. The Cornea. IX. Leprosy, Tuberculosis and Syphilis of the Eyes. X. Endogenous Infections. XI. The Orbit. We can especially commend the careful study of Chapter II, "The Normal Conjunctiva," because the commonly present organisms, such as the Bacillus Xerosis, bear such a close resemblance to pathogenic varieties, e. g., Loeffler bacillus, that until one becomes throughly *au fait* into the features of the former (xerosis) confusion is certain to arise in the diagnosis between it and the latter. In this connection great care has been devoted to the differential diagnosis, the culture and staining reactions especially with Neisser's stain being particularly insisted on. As regards the pathogenic organisms, their effects are very clearly set out and the differential diagnosis lucidly described.

The book throughout maintains a high standard of excellence, the illustrations proving exceptional examples of high class work, and it brings the bacteriology of the eye into line with that of the remainder of the body. The whole work is indispensable to an eye surgeon and quite within the scope of any practitioner accustomed to the use of a high-powered microscope, even if not *au fait* with bacteriological technic, but under these circumstances the assistance of a sound elementary text-book on general bacteriology would be of material assistance. A. A. BRADBURNE.

**Die Augenarztlichen Operationen.**—CZERMAK, PROF. DR. WILHELM. 718 pp., illustrated. Price, 25 marks ($5.00). Unbound. Urban & Schwarzenberg, Berlin.

This continuation of Czermak's monumental work on eye operations — the second edition enlarged — has been brought forward under the editorship of Anton Elschnig, the successor of the lamented Czermak in this work and in the professorship of ophthalmology in the University of Prag, Austria.

This portion begins with the sixth subdivision, with operations on the globe, taking up generalities on operations, proceeding then in detail to operations on the cornea, the sclera, the iris, the lens, the vitreous and the retina. To show the scope of the work, 81 pages are given to iridectomies alone and 305 pages to the cataract operation. Practically all the forms of operations that are now made are fully described. I find, however, that a description of the most popular American operation—the McReynold's transplantation—which in my hands and in many of my confrères has practically superseded other pterygium operations—has been omitted.

The Major Smith's expression of cataract in the capsule is not in favor with the author. It is shown to be a simple derivation from that of Pagenstecher and a description of the latter operation in quotation from Pagenstecher's own writings shows that only when the lens did not come out on pressure was the spoon to be inserted behind the lens and lifted out.

This work is indispensable to the progressive ophthalmologist and a perusal of its pages would probably prevent the publication of so-called new operations as original to certain modern authors, as they have been thought of, described and practiced, and in many instances have been superseded by others or cast aside for well-tried and faithful procedures in previous years.

In such a monumental work it is impossible to do more than dip in here and there in search of that operation or procedure which is of interest at the moment. Any one writing upon any kind of ophthalmic operations should certainly have this work in their library.

A full translation in the English with reproduction of the admirable illustrations is devoutly to be wished. The only changes in the latter we would like to see would be that the cuffs and coat sleeves of the operator be removed and replaced by the bare arms of the modern aseptic surgeon. H. V. Würdemann.

**Therapeutisches Taschenbuch fur die Augenpraxis.**—Adam, Curt, M.D., Assistant to the University Eye Clinic in Berlin. 250 pp. Illustrated. Price, 5 marks ($1.25). Urban & Schwartzenberg, Wien.

When a so-called pocket book on any medical subject is examined the reader may perhaps wonder why it has been published, so many are but a digest of well-known facts and a repetition of other books already in the market; but with this work of Dr. Curt Adam the reader is most agreeably surprised — it contains so much, is so thoroughly modern, so well compiled and written that it is a welcome *vade mecum* to the practical ophthalmic therapeutist. Particular attention is paid to the differential diagnosis of the more common eye affections, a regular university course being given in this branch; yet it touches upon the less common affections, bringing the relation of the ophthalmology to general medicine constantly forward in such a manner that specialists themselves will welcome the work for its peculiar insight. Minor eye operations, such as may be practiced by the general physician, are fully described, sufficient notice being taken of larger operations.

The author's description of modern therapeutics and methods is particularly welcome. He begins with a brief description of local examination of the eye, going on to the materia medica, takes up general treatment and modern methods—for instance, in the diagnosis of syphilis he gives a description and diagnosis of the spirochæta, of the serum, diagnosis of Wassermann; treatment by injection is particularly recommended in the acquired form—inunctions, etc., in syphilis. In tuberculosis the diagnosis by Koch's old tuberculin, the cutaneous reaction of von Pirquet, the conjunctival reaction of Wolff-Eisner and Calmette, the serum diagnosis and animal experiment are described. Under specific therapeutics the tuberculin Koch and Behrings Tulase treatment with Tulase-laktin and anti-tulase and the combined method are fully described, together with the general and local treatment. Other forms of serum treatment, pneumococcus, hefeserum, anti-diphtheritic, Marmorek's anti-streptococcus serum, and even the cataract tablets of Römer are described. Bier's hyperemia treatment, subconjunctival injection, Salge's scrofulo-tuberculous treatment., etc., are given.

He then goes on to narcosis, paying attention to scopolamin-morphin anesthesia, local anesthetics, etc., and general treatment. He then takes up the treatment of special diseases, beginning with the diseases of the lids, describing all those of the ocular structures and adnexa; a few pages on refraction and prescription of lenses are well given. His chapter on injuries to the eye, i. e., the first help in eye injuries, is well worth pursuing and of particular interest. Prothesis, visual economics, a list of the blind institutes in the German Empire and a particularly eligible and full series of 150 ocular recipes and a full index complete the volume. It is well printed, bound in limp cover and has well selected illustrations H. V. Würdemann.

**Festival Address at the Opening of the New Eye Clinic, Carlstrasse 36, Berlin.**—Hirschberg, J., Prof., Berlin. "Festschrift zur Eroeffnung der neuerbauten Augenheilanstalt, Carlstrasse 36, Berlin." Leipzig: Veit & Co., 1908.

At the inauguration of the new institution of Professor Hirschberg, erected on the same ground on which his former clinic stood from 1873 to 1907, Hirschberg delivered a most interesting address on the origin and development of ophthalmology, the founding of eye hospitals, and the teaching of ophthalmology through the course of centuries, with a report on his 353 magnet operations, as this operation belongs to the signature of his clinic. Then follow statistics on the number of patients treated, and a brief description of the clinic by W. Muehsam. C. ZIMMERMANN.

**On the Pupil. Anatomy, Physiology and Pathology, Methods of Examination.** "Pupillenlehre. Anatomie, Physiologie und Pathologie. Methodik der Untersuchung. BACH, LUDWIG, PROF., Marburg. 344 pp., with 27 partly colored illustrations in the text. Berlin, 1908. S. Karger. 12 m. $3.00.

The author, who by his experimental researches and clinical observations on the pupillary phenomena within the last few years has become well known, gives in this elaborate and complete treatise another proof of his great familiarity with the subject.

In the first section, on the anatomy of the pupillary paths and centers, he describes the path of the reflexes to light, commencing with the retina, placing the receiving organ, according to the recent investigations of C. Hess, in the outer portions of the cones. Deviating from Hess, the existence of at least two different kinds of fibers in the optic nerve, the optic and the pupillary fibers, is upheld. According to Bach, the pupillary fibers branch off from the optic tract, before the external geniculate body, to the lateral portion of the anterior corpora quadrigemina. The medial portions of the proximal nucleus of the third nerve are brought in relation to the sphincter of the pupil.

In the second section, on physiology, the mechanism of the iris movements are considered, especially the anatomical and physiological proofs of the existence of the dilatator muscle, the width and form of the pupil, the various reflex contractions of the pupil, the light reflex according to the investigations of Hess, the reflex dilatations, the conditions of the pupil during sleep, in old age, exhaustion, agony, death, and after decapitation.

The third section deals with the general pathology of the pupil, the influence of mydriatics and miotics, especially atropin, cocain, adrenalin and related extracts, and eserin, pathologic mydriasis, miosis, anisocoria, the disturbances of the paths of contraction, first the centripetal, as amaurotic and hemianopic immobilities, then the centrifugal disturbances, as absolute iridoplegia, etc., reflex immobility, its explanation, pathologic anatomy, occurrence, differential diagnosis between reflex and absolute immobility, etc.

Under special pathology, in the fourth section, follow the ocular and orbital diseases, the relations between localization and pupillary symptoms in affections of the nervous system, the different parts of the brain, spinal cord, especially locomotor ataxia, the meninges and peripheral nerves, then syphilis of the nervous system.

Here the author emphasizes that interior ophthalmoplegia, due to a lesion of the nucleus rather than of the trunk of the third nerve, which, however, has been opposed by Wilbrand and Saenger, occurs more frequently in syphilis than in general paresis or locomotor ataxia. Absolute immobility and interior ophthalmoplegia are amenable to specific treatment. The prognosis is not good, as some cases in which the disturbances abated developed, though after years, locomotor ataxia or paresis.

The next chapters are on mental diseases, particularly paresis, accidental neurosis, migraine, epilepsy, dementia, neurasthenia, hysteria. The author, from his experience, is convinced of the dependence of pupillary phenomena upon hysteria during and between paroxysms, which, however, can not be utilized for differential diagnosis, excepting perhaps the intense miosis with spasm of convergence.

Of the toxic diseases of the nervous system, alcohol, nicotin, opium and inhalation narcotics, especially chloroform and ether, receive a detailed presentation. The pupillary phenomena, observed in many intoxicants, are tabulated according to Albrand and Schroeder.

The last chapter contains exhaustive discourses on the methods and apparatuses for examination of the pupil, directions for the practice, with numerous examples, illustrating different affections, and the author's own method. A bibliography of 1778 numbers, a table of contents and an index are added. Paper and print are very good, and the numerous illustrations are well executed and very instructive.

The valuable work contains about everything of this intricate subject that is worth knowing, including the most recent researches, and deserves the widest circulation. C. ZIMMERMANN.

**Exophthalmic Goiter.**—SATTLER, H., PROF., Leipzig. "Basedow'sche Krankheit." Greafe-Sæmisch. Handbuch der gesamten Augenheilkunde. Second, entirely new, edition. Nos. 143 to 147. 384 pages, with 5 figures in the text. Leipzig: Wilhelm Engelmann, 1908. Subscription 10 m. $2.50. Regular price, 15 m., $3.75.

Although not yet finished, the present numbers of Sattler's elaborate monograph occupy five times as many pages as the whole first edition. First, the symptomatology of the four cardinal signs of the disease, affections of the heart and arteries, thyroid glands, exophthalmus and tremor, is discussed from Sattler's own observations and literature with abundant casuistics.

Sattler considers exact exophthalmometric measurements of great value for discriminating the influence of therapeutic, especially surgical, procedures. They also show an increase of exophthalmus upon compression of the facial veins, which suggests in exophthalmic goiter with intense exophthalmus in erect position of the head the efflux of blood from the orbit also through the facial veins, which under normal conditions occurs only in stooping of the head. The noises, heard on auscultation of the eye, are muscular and have nothing characteristic.

Sattler has for years devoted special attention to the interesting lid symptoms, which are discussed in detail, and is certain that he never met them without other nervous symptoms, or symptoms of Graves' disease. With regard to the diagnostic utilization of the lid symptoms, some less frequent and, therefore, less known, causes of gaping of the palpebral fissure are mentioned, as in certain palsies of the ocular muscles, especially of the raisers, or in reconvalescence from paralysis of the third nerve. Sattler never observed the same degree of gaping of the palpebral fissure after maximal action of cocain as in marked retraction of the upper lid in exophthalmic goiter, which, with other points mentioned, he considers as a proof against the explanation of the lid symptoms by spasm of Müller's muscles. He attributes the three-lid symptoms to increased opening tension of the eye as pronounced by Moebius.

The author doubts the correctness of the statements of O. Becker as to pulsations of the retinal arteries, which have without critics been propagated in text-books and monographs, as he saw only in two out of eighty cases fluctuations of the lumen and in eight lateral displacements of the reflex streaks of the retinal arteries. The distressing increase on decrease of lacrimal secretion is attributed to secretory neurosis.

The fortunately rare suppuration and destruction of the cornea which were observed predominately in the male sex and then in decrepit individuals above 40 suggests, according to Sattler, toxic influences on the tissues.

Regular nystagmus is very rare, although tremor is one of the most constant symptoms of the disease.

It would lead too far to enter more closely into other disturbances in exophthalmic goiter, which receive the most exhaustive discussion, as convulsions, chorea, epilepsy, paralyses and paraplegia, ophthalmoplegia and bulbar paralysis, myasthenic paralysis, hemiplegia, spine diseases, multiple neuritis, tendon reflexes, sensibility, headaches, disturbances of sleep, complications with other diseases of the nervous system, as locomotor ataxia, hysteria, neurasthenia, mental changes and psychoses, vasomotor disorders, as of perspiration, hemorrhages, and symptoms of the digestive, respiratory, sexual organs, skin, osteomalacia, acromegaly, myxedema, alteration of metabolism, influence of thyroid substances on it, hyperthermy, blood states, chlorosis, lymphatics and lymphoid organs, glycosuria and diabetes.

Sattler's admirable work is pervaded by a spirit emanating from unusual experience and critical knowledge which makes the reading of it most interesting and profitable. It is another brilliant addition to the volumes of the great handbook of Graefe-Saemisch.

C. ZIMMERMAN.

**Handbook of General Pathology.**—KREHL, L., PROF., Heidelberg, and MARCHAND, T., PROF., Leipzig. "Handbuch der allgemeinen Pathologie." In conjunction with Albrecht, E., Frankfurt a/M., Aschoff, L., Freiburg i. Br., Askanazy, M., Genf, von Baumgarten, P., Tuebingen, Beneke, R., Marburg, Boehm, R., Leipzig, Ernst, P., Heidelberg, Fraenkel, C., Halle, Henke, F., Koenigsberg i. Pr., Hering, E., Prag, Hess, C., Würzburg, Hirsch, K., Goettingen, His, W., Berlin, Hoche, A., Freiburg i. Br., Klemensiewicz, R., Graz, Kraus, F., Berlin, Kretz, R., Prag, Luethje, H., Frankfurt a./M., Minkowski, O., Greifswald, Moritz, F., Strassburg, Paltauf, R., Wien, Romberg, E., Tuebingen, Schmidt, M. B., Zuerich, Schwenkenbecher, A., Marburg, Sobernheim, G., Berlin. Volume I: General etiology. 601 pp. Leipzig: S. Hirzel. 18 m., $4.50.

We take great pleasure in bringing to the knowledge of our readers the appearance of this important work, in which a comprehensive presentation of the doctrine of the pathological processes, including their causes, is intended. The present volume, on general etiology, is preceded by a masterly written introduction on general pathology as a biological science, its object and methods, by F. Marchand. The general etiology is considered under two sections: external and internal causes of disease.

Chapter 1 contains the mechanical causes of disease, by F. Henke, their various kinds, infection after traumatism, traumatism and formation of tumors, influence of pressure on the tissues and subsequent changes of shape of the organs, etc.

Chapter 2, by F. Marchand, deals with the thermic causes: heat, the resistance of lower organism against heat, local effects of high temperatures, combustions, radiating heat with causes of death, hyperthermy in man, and experimental hyperthermy in animals, insolation; in the same way with the action of cold and colds.

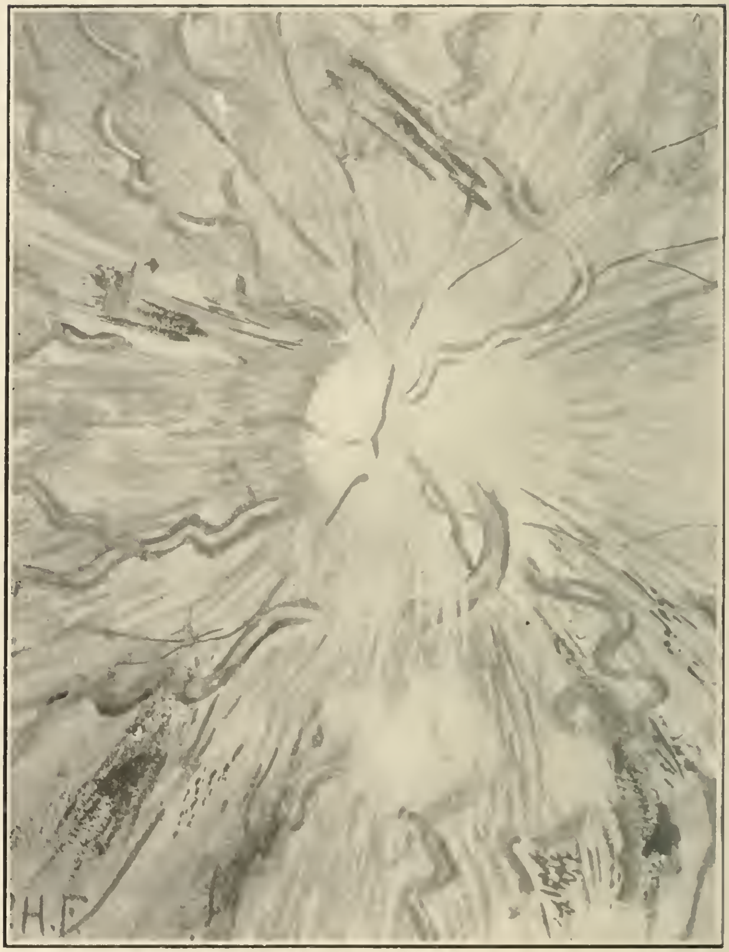
Then follow chapters by L. Aschoff on radiating energy, as electricity, light, Roentgen and radium rays, and atmospheric pressure; by R. Boehm on chemical morbid causes, viz.: general toxicology; by C. Fraenkel on microbes, discussing infection, protozoa, bacteria, trypanosomas, etc.; by F. Marchand, on the biology and importance of animal parasites as morbid agents.

Under internal causes of disease, congenital and acquired disposition, heredity and constitution, are most interestingly propounded by P. von Baumgarten. The last chapter by G. Sobernheim sets forth the doctrine of immunity and the natural protective properties of the organism, as the antibacterial action of the normal serum, natural resistance of the individual, natural and acquired immunity, specific protective substances, as antitoxins, bacteriolysins, opsonins, agglutinins, immunity and formation of antibodies against non-bacterial substances, as hemolysins, cytotoxins, etc., serum therapy, serodiagnostics.

A bibliography is appended to each chapter, and carefully prepared indices of subjects and names and a table of contents greatly facilitate orientation.

The second volume will contain the pathologic disturbances of the functions of the organs (circulation, respiration, secretion, nervous and psychic processes), the third the general disorders of metabolism and degenerative processes, and the fourth inflammation and healing, including regeneration and transplantation, the principles of the doctrine of new formations, malformations and fever. The clinical symptomatology is only considered as far as it serves to the understanding of the phenomena.

As it is impossible for the individual physician to sufficiently follow the progress of general pathology dispersed in the immensely growing literature of the world, and still so necessary for him to know and to apply to his own field, such a work conveying this knowledge accumulated by the cooperation of so many competent and critical authors is of inestimable value, and, in its clear and pleasant style, most fascinating. C. Zimmermann.



FRIDENBERG.

OBSTRUCTION OF CENTRAL RETINAL VESSELS.

OPHTHALMOLOGY
ESSAYS, ABSTRACTS AND REVIEWS.

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## Original Articles

# ARTERIOSCLEROSIS AS A FACTOR IN OBSTRUCTION OF THE CENTRAL RETINAL VESSELS.*

Percy Fridenberg, M. D.,
NEW YORK.

In his contribution on the Diseases of the Retina in the Graefe-Saemisch Handbook of Ophthalmology, over thirty years ago, Leber concludes the section on obstruction of the main branch with the following words: "The doctrine of embolism of the central artery now rests upon a firm basis of pathological anatomy, but important questions of detail are still undecided and a matter of controversy."

We may say of theories in regard to this serious and important affection, as of political revolutions, "Plus celà change, plus c'est le même chose," and while there is a tendency to accept a broader range of etiological possibilities, in causation and mechanism, a recognition, above all, of the important role played by general and local arterio-sclerosis, and the multiplicity of factors which may produce it, there is no reason to believe that the last word has been said of this interesting topic. In this connection, the report of two cases may be of interest, which have as striking features the development of two quite dissimilar and serious retinal lesions, embolism and venous thrombosis, respectively, on the uniform basis of local arterio-sclerosis, and which present slight but unmistakable evidence of the underlying vascular disease in the apparently unaffected eye.

Case 1.—Alois P., aged 69. Married at age of 29, and has a number of grown children, all healthy, with good eyes. Denies specific infection and has never had any symptoms. Has been a heavy beer drinker for 35 years, taking as many as 50 to 60 glasses a day, and often averaging 10 to 15. He also smoked 15 or more cigars a day for many years. Indulged very sparingly in spirits. Has always worked very hard physically, and has driven an ice wagon since he was a young man. Always well until about five years ago he passed occasional bladder calculi. Claims that these attacks of stone were always preceded by a crop of boils or "carbuncles" as he calls them. This occurred so regularly that he always knew beforehand that he was going to have the gravel. A year or two ago the attacks of carbuncles ceased, and he knew that the gravel would not come back. This proved actually to be the case until this year when with the onset of blindness an attack of urinary calculi again came on. Patient came to the New York Eye and Ear Infirmary on July 8th, 1908, saying that he had suddenly gone blind in the left eye the day before. He had been attending to his work as an ice man and had done for the day and gone into the office to make an entry in the books. As he did so he felt his sight going so rapidly that he could not finish the few lines he had to write, and "in a minute or so" he was completely blind. There was no pain in the eye and no headache, and the right eye was not affected.

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*Read Nov. 16th. 1908. Sec. on Ophthal. N. Y. Academy of Medicine.

OPHTHALMOSCOPIC EXAMINATION.—After dilation of the pupil with cocain, the characteristic picture of embolism of the central artery was seen, with markedly contracted arteries, approximately normally wide veins, some general edema, and the cherry red spot at the macula contrasting with a more marked grayish white opacity. No pulsation could be made out in any of the vessels on the disc, and there was no breaking up of the blood column or retrograde movement in any of the peripheral arteries or veins. As the obstruction was recent, nitro-glycerin was immediately administered by hypodermic, gr. 1/100, and direct massage of the posterior segment of the globe applied for about ten minutes. Vision had been reduced to bare perception of light and was not immediately affected by treatment. The patient was instructed to continue the massage at home, two or three times a day, and to take nitro-glycerin in tablets.

Examination of the right eye, which the patient thought all right, revealed distinct evidence of early arterio-sclerotic changes in the medium sized arteries consisting in contraction and increased brilliancy of the central light reflex and a general paleness of the red color of the vessel, tortuosity of smaller macular branches, and decided compression signs at arterio-venous crossroads.

The patient was referred for physical examination to Dr. Leo Kessel, to whom I am indebted for the following report: Patient a large, well nourished, powerful man. Muscular system fairly well developed. Lungs: Emphysema. Heart: Left ventricle is hypertrophied. The apex beat is indistinctly palpable in the fifth inter-space just outside the mid-clavicular line, but not visible. Heart action; regular, 86 per minute. The sounds are clear. No murmurs. Both sounds at apex accentuated. Marked accentuation of second aortic sound; less marked accentuation of second pulmonic. The temporal, brachial, radial and dorsalis pedis arteries are considerably thickened. Arch of the aorta is dilated and can be felt pulsating in the suprasternal notch. The blood pressure is increased, systolic pressure being 190, diastolic 120. Liver palpable one finger breadth below the free border of the ribs; smooth, and not tender. The remainder of the abdominal examination is negativ. Urine, amber; acid, 1024, and contains no albumin nor sugar. Microscopically negative. Diagnosis: Cardiac hypertrophy, general arterio-sclerosis, increased blood pressure and emphysema.

The patient was seen every second day or so, for a number of weeks, in which time vision improved slightly until he was able to distinguish the hand at 2 feet. This amelioration was, however, only temporary, and within a few weeks vision had again was reduced to bare perception of light. From this time on the signs of retinal arterio-sclerosis and of marked obstruction in arteries and veins increased in the left eye. The portion of the central artery on the disc was converted into a dense white cord, and perivascular striations could be seen on numerous smaller branches. In some, the white degenerated cord-like structure could be traced directly into the red blood column of neighboring apparently permeable portions of the vessel, and must have represented a thickening of the inner wall. In several obstructed areas there was a noticeable proliferation of small, newly formed capillaries, evidently an index of persistent high tension with diminished venous off-flow and an attempt at establishment of a collateral circulation. These vascular or capillary proliferations were generally tree-shaped, but several of an irregular form were also noted at the edge of the disc and in the retina near by. A few small hemorrhages, both venous and arterial, have been observed, but no extensive effusion of blood. The veins have at no time been markedly dilated, altho somewhat tortuous. The changes in the vessel walls are, however, very marked, and the white areas of thickening and degeneration almost as striking as in the case of the arteries. In the better eye the changes have also become more decided, altho as yet there have been no marked degenerative changes and no hemorrhages. There is an indication of the deleterious effect of the vascular disease upon the nutrition of the retina is a wedge-shaped arc corresponding to the course of an upper temporal artery, which shows a granular or finely nodular thickly sown deposit of a grayish yellow color in the deeper layers, evidently a low grade inflammation or degenerative process dependent on insufficient blood supply.

There are a number of interesting points in this case. The most striking is perhaps the sudden development of one of the most serious lesions with little or no preliminary signs of danger. The first indication of trouble was the abrupt and complete occlusion of the central retinal artery with the usual severe disturbance of function and grave prognosis as to vision and life. The etiology is significant. Here was a strong, active man doing the heaviest kind of work year after year, lifting heavy cakes of ice and carrying them for considerable distances, exposed to extremes of heat and cold in cellar and ice-house, on the one hand, and in the broiling summer sun of New York streets, on the other, smoking to excess, and drinking enormous quantities of weak alcohol and extractives, in the form of beer. For thirty-five years all these factors had uninterrupted sway. If ever a man was entitled to arterio-sclerosis, this patient certainly was.

Case 2.—Jette C., aged 76, married since the age of 18, Has had 11 children, including 2 pairs of twins, all of whom died when a few weeks to ten months old (difficult labor), one girl who died in three days, another who died aged 1 year of catching cold, one still born, and another died later on. Three living and healthy sons. Obscure history of one abortion. Patient's mother died at 73. Father earlier, in Jerusalem, whither he had gone to recover from sickness brought on by excessive fasting. (Husband says both her parents died blind.. Operated for hemorrhoids in Koenigsberg at age of 60. Soon after had acute articular rheumatism (?), leaving cardiac complication and persistent stiffness and occasionally pains in left shoulder and both elbows and wrists.

Several weeks ago had a temporary indefinite obscuration of vision, in both eyes, with some subjective sensations of colors, lasting about fifteen minutes. About a week ago, on arising, felt something wrong with sight, and on covering eyes successfully found that there was no sight in the right. No treatment.

Several days later was brought to the New York Eye and Ear Infirmary, November 11.

V. O. D. with sph. + 1.50 D. = 20/xxx. Jaeg. No. 1 w. sph. + 4. D.

V. O. S. = + Fingers at 8 ft. varying in different parts of field.

Pupils medium large, regular, even, dilate very fully and easily after one instillation of cocain, 4%. T. normal.

Ophthalmoscopic examination reveals in the right fundus the typical picture of retinal apoplexy, with some swelling and marked clouding of the nerve head; in other words, a hemorrhagic neuro-retinitis with a suggestion of thrombosis of the central vein. The arteries are almost without exception narrower than normal, but there is no marked evidence of disease of the artery walls. The veins are greatly dilated, excessively tortuous, and hidden in many places by hemorrhages, œdema, or greasy white retinal deposits of a generally round shape with indefinite outlines. The hemorrhages are found in all parts of the fundus, and may be inferred by peculiarities of size, shape and distribution to be scattered pretty well through all the retinal layers, although flame-shaped and coarse striate effusions into the nerve fiber layer, obscuring even large vascular branches, predominate. There is evidence of extreme obstruction in the venous circulation, not only in the tortuosity of large branches, but in dilation of the capillaries on the swollen disc and the apparent new formation of small congeries of capillary twigs about the first division of the central retinal artery.

The fundus of the left eye shows no marked lesions, but careful examination in the upright image shows unmistakable evidence of pathologically increased blood pressure in the presence of progressive venous pulse. This is particularly noticeable when the patient has been standing for a while and the heart action is excessive or irregular. Physiological venous pulsation on the disc is not entirely abolished. The vessels themselves show signs suggestive of arterio-sclerosis. The light reflex on the arteries is not as clean cut as in normal cases, the outline of the vessel wall showing a tendency to irregularity. There is an indication of perivasculitis in several branches of the artery, and a marked whitish discoloration of a macular branch for some distance outward from the disc. It is impossible to make out any column of red blood in this vessel over the affected area. The disc is waxy and of a dirty yellow hue. The arteries are all decidedly narrow. There is a progressive dilatation of all the veins, so that they are smallest on the disc and widest at the periphery. This abnormality is very striking. At one point where an artery crosses an inferior nasal branch of the central vein, the latter has lost its light reflex for a short stretch on either side of the dam, and is obscured where the artery crosses it. There is, however, no marked twisting of the vein, no decided compression, and no dilatation to either side of the crossing. The retina seems thin and there is little, if any, pigment, so that the choriordal circulation can be seen with great distinctness. This is not uncommon in the aged, and is of no clinical significance. The arrangement, size and shape of the chorioidal vessels, however, is decidedly suggestive of angio-sclerosis, as they are narrow, twisted, snarled, some of them discolored grayish yellow, and altogether look stiff, crinkly and shrunken. Throughout the retina there is a granular texture, as it were, which at various points amounts to an actual deposit in the deeper layers of grayish white irregular nodules, some of which are highly refracting, about which the tissue of the retina appears dirty yellow instead of red. In the superficial layers there are also deposits of a somewhat more sharply defined character, the individual nodules being smaller, brighter and of a more angular outline, suggesting lime deposits or some other crystalline formation. These dots are sprinkled about the macular region and around the disc. The fundus changes certainly indicate the presence of persistent high tension and are at least suggestive of arterio-sclerosis. In view of this finding, the condition in the right eye may be interpreted as a thrombo-phlebitis of the central retinal vein, and possibly of a number of its branches, dependent on local vascular disease, and presenting the picture of sanguineous apoplexy of the retina. The temporary obscuration of vision noted in the history as having come on two months before the attack of sudden blindness is suggestive of endo-phlebitis with markedly narrowed veins; which for a short time were completely occluded, either by collapse of the wall incidental to some drop in blood pressure through irregular heart action, or by vascular spasm. It is significant that this fugaceous clouding came on just after the patient stood up to go out walking in the morning, and disappeared after she had sat down to rest.

History.—Soon after the discovery of the disease picture of embolism of the central artery by Albrecht v. Graefe (1859), doubt was expressed by Mauthner as to actual embolism being the only and exclusive cause of the clinical picture, and he thinks that many of the cases reported allow another interpretation. Loring (1874), Nettleship (1879), Noyes and Parinaud

(1882) took the same position, which was expressed most decidedly by Priestly Smith (1884). Galezowski, in 1886, first laid stress on the fact, which Leber and Manz had already recognized, that thrombosis may account for the symptoms and ophthalmoscopic appearance in some of these cases, and this view was accepted by Haab and his school.

It was due mainly to the investigations of this writer and his followers, Kern, Reimar, Streiff, Welt, Galinowsky and those of v. Michel that the views of German ophthalmologists, which had been based on the single case of Graefe-Schweigger, have been almost completely changed.

Today there is a general recognition of the comparative frequency of arterial obstruction due to local processes as the main feature in the picture of so-called embolism, while critical analysis of the last few years, based on more exact knowledge of the pathology of the vascular system, has shown that the embolic nature of this affection has not been anatomically proven beyond a doubt in even a single case. It always will be difficult to prove.

American authors seem to be in accord with Marple and with Coats and other English observers, who hold "that our German confrères go much too far when they affirm that embolism of the central artery has never occured."

*Obstruction of Central Vein.—History.*—Knapp was probably the first to express the opinion (1869) that thrombosis of a retinal vein may give rise to retinal hemorrhages in the area it supplies. In his case of so-called hemorrhagic infarct, Knapp, it is true, believed that embolism of the associated artery had induced thrombosis of the vein, and that subsequent reëstablishment of the blood current had allowed an effusion of blood from the vein. Leber (1877) and Hutchinson (1878) had called attention, before Michel's publication, to the fact that a hemorrhagic retinitis might be caused in many cases by venous thrombi. Leber reported such a case in which he observed the thrombus, probably with the ophthalmoscope only. Galezowski (1869) first called attention to the predominant unilaterality of the process, and Michel, in 1878, gave the first complete account of the clinical and anatomical picture of this venous thrombosis and differentiated it from the other hemorrhagic diseases of the retina. He lays stress on the sudden blindness, the marked dilatation and tortuosity of the veins, with comparatively relatively narrow arteries, the presence of large lakes of blood at the posterior pole and the absence of glaucoma. The first postulate is still maintained. Hemorrhages are not always of the character mentioned. In advanced sclerosis they may be splattering. Sclerosed vessels may burst sooner than normal ones, but they do not allow hemorrhage by diapedesis as easily. We know now that glaucoma does occur as a complication of venous thrombosis. Michel recognized the importance of arterio-sclerosis as an etiological factor in thrombosis, and was one of the first to see that the local disturbance of circulation due to sclerotic narrowing of the retinal arteries were another important cause of coagulation. For over ten years but little notice was taken of this point Marantic thrombosis of the vein has been observed in greatly debilitated subjects, with weak hearts, in albuminuria of pregnancy, and as a complication of vascular disease of the retina. The common picture of venous obstruction, however, as seen by the ophthalmologist, is mainly the result of vascular lesions of the retina, particularly of the veins. This may, of course, be part of a general arterio-sclerosis, which, however, may be slight and cause no symptoms, so that we have apparently to deal with healthy individuals.

Among recent writers, Harms (Graefe's A. f. O., LXI. I. 1) has given a most careful and complete account of the microscopical findings in disease of the retinal artery and vein. Two of his cases presented the clinical picture of so-called embolism: seven, of hemorrhagic retinitis, and three, of glaucoma with intraocular hemorrhages. He claims that true embolism of the central retinal artery in the sense of v. Graefe does not exist anatomically.* Obstruction of the central artery may be produced:

(1) By thrombosis of a free lumen without previous endarteritis;

(2) By primary proliferating endarteritis.

Sudden blindness may be caused by secondary thrombosis, as shown by Michel's case. Canalization of a thrombus with consequent partial permeability of the vessel has been proven (Coats; Sidler-Huguenin) to be a possible anatomically explanation of an improvement in vision. Anastomoses in the optic nerve may be a factor in such a fortunate result, as in the

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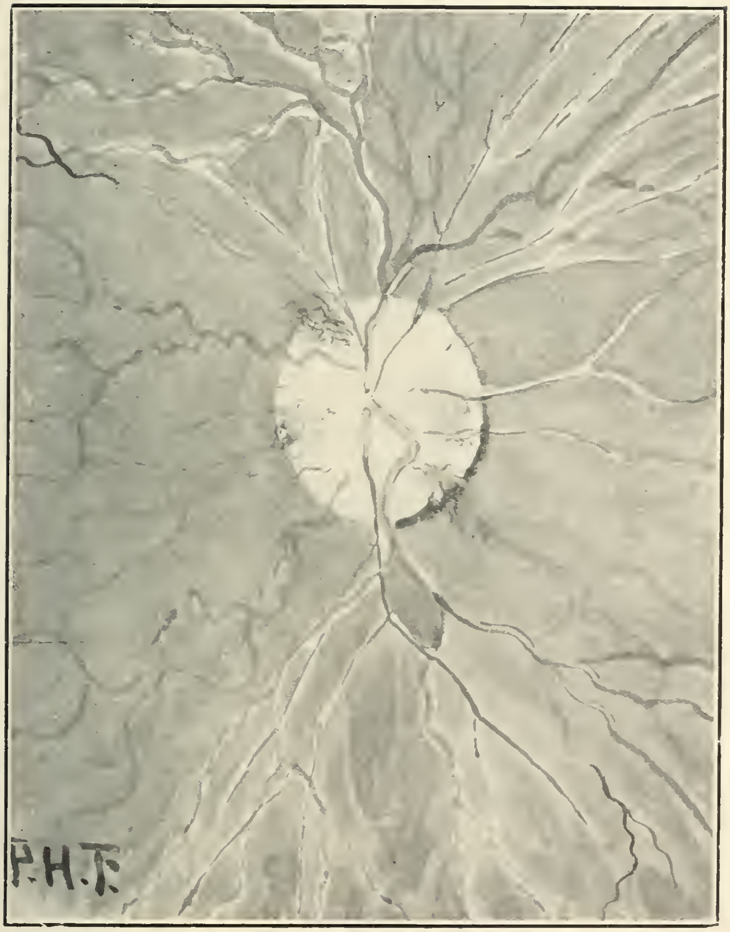
*Harms and Haab consider Marple's case as one of occlusion of the central retinal artery by a thrombus on the basis of a primary proliferating endarteritis.



FRIDENBERG.

OBSTRUCTION OF CENTRAL RETINAL VESSELS.

cases of Axenfeld (Klin. Monatsbl. f. Augenhlk. XLI. Supplement) and of Hormuth (Berl. lin. Wochenschr. 33, No. 41, p. 925).

Primary proliferation of the intima produces the picture of pure embolism only in case no venous thrombosis has preceded.

(3) By chalky concretions;

(4) Interruption of circulation in the ophthalmic artery only rarely causes the picture of embolism of the central artery, and is then explained by absent or insufficient collateral circulation (Uhthoff).

Closure of the central retina vein may be due to:

(1) Thrombosis of a formerly free lumen;

(2) Progressive proliferating endo- and meso-phlebitis, causing direct and complete occlusion, giving rise to a secondary thrombosis;

(3) Obstruction of the vein causes signs of general retinal engorgement; (a) in the form of lakes of blood with dilated and tortuous veins and contracted arteries, if the veins are not disease, or (b) as splattering, *i. e.*, multiple punctuate and striate, hemorrhages with contracted veins and arteries in case of previous angiosclerosis.

(4) Hemorrhages may be absent or slight in occlusion of the main trunk of the vein: (a) in weak heart action, marantic thrombus, or incomplete occlusion; (b) in the presence of a collateral circulation (cilio-retinal vein or congenital anastomoses with the vein trunk);

(5) Thrombosis of the central vein may be complicated by glaucoma;

(6) Extensive retinal hemorrhages may be caused by diffuse inflammatory disease of the retinal arteries, true hemorrhagic retinitis.

Occlusion of both vessels may present the picture of embolism of the central artery, of thrombosis of the central vein (hemorrhagic retinal apoplexy) ,or that of hemorrhagic infarct, the other two. Primary sclerosis of one vessel may create thrombosis of the other by obstructing the blood current, and this, in turn, may increase the sclerosis of the originally diseased vessel, or even lead to complete thrombotic closure of its remaining lumen. Verhoeff is of the opinion that obstruction of the vein was due to thrombosis in only two of the 18 reported cases, where it was of a septic character. The others gave histological evidence of being caused by proliferating endophlebitis. The so-called canalized thrombus is in the nature of a dissecting aneurysm. Again, the secondarily affected vessel may be occluded first and thus determine the clinical picture, while the other vessel would show more advanced and serious anatomical lesions.

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## DISEASE OF BOTH CENTRAL VESSELS, OR THEIR BRANCHES UNDER THE PICTURE OF SO-CALLED HEMORRHAGIC RETINAL INFARCT.

In most cases the primary affection of the trunk extends to the retinal branches, venous or arterial, as well, before the other main vessel is completely closed by secondary thrombosis.

Complete closure of both vessels is almost invariably due to the local disturbance of circulation caused by the primary disease of one. Only a single case (Gonin) is on record in which external pressure of an orbital exudate caused double obstruction.

Occlusion of both central vessels by the same simple process, pure thrombosis or pure proliferating endo-vasculitis, has not been demontsrated.

The ophthalmoscopic picture described as hemorrhagic infarct of the retina (Cohnheim) or post-anemic hemorrhages is an expression of the combination of so-called embolism of the central artery and that of venous thrombosis, not only clinically, but anatomically.

Anomalies in the course of the central vessels were found in 25% of these cases, and may be of importance in predisposing to sclerosis as Michel and others have shown that thrombosis has a predilection for just such points.

Arterio-sclerosis can best be studied in the eye, as serial sections give a complete survey of a circulatory area, which is completely isolated, and permits an accurate conclusion as to the effects of the circulatory disturbance on other sections of the vessel. The marked functional disturbance caused by complete obstruction allows us to determine, almost to the minute, when this accident occurred, and the subsequent course of the disturbance of circulation can be followed almost as if it were under the microscope by ophthalmoscopic examination. We have to deal with an area supplied by small vessels, in which the changes can be noted clinically, which in other organs would certainly escape detection and observation.

Does simple non-septic embolic occlusion of an artery affect the wall of the vessel directly in front of or behind it? Does an inflammatory reaction take place? This has not been decided, but there is no doubt that thickening, due to secondary contraction, does occur. In the case of simple, primary venous obstruction, the vein is inflamed actually, except just where the thrombus lies, showing that it was not due to primary affection of the wall of the vein. The organization of the thrombus is purely a function of the endothelial cells in both arteries and veins, and the other tissues of the vessel wall are found to be intact, unless previously diseased.

How do arterio-sclerosis and phlebo-sclerosis develop in the central retinal vessels and small vessels in general?

In the central artery, as a primary thickening of the intima, due to cell proliferation, increase of the elastic elements, or a connective tissue deposit on the inner surface of the vessel wall. These processes may be combined or succeed one another. Hyaline sclerosis is, however, the most common form in the retina. Deposits of lime, fatty cholestearin, or amyloid may be found in the proliferating intima, but mucoid, atheromatous and ulcerative degenerative processes are unknown. The media is not affected. Mechanical factors are etiologically important, as shown by the predilection of the process for the neighborhood of the lamina, where the artery is most exposed to stretching and twisting during the constant movements of the eye. Aside from the material supplied by local degeneration in the vessel walls as a basis for an obstructing mass, we must consider the possibility of embolism by air, by fat in extensive fracture of long bones, or in the unusual case reported by Seydel of acute phosphorous poisoning, the extension of a thrombus or invasion of an embolus from a ligated carotoid, or a thrombosed cavernous sinus, by a mass of white blood corpuscles in leukemia and, finally, the complete obliteration of the lumen of the central vessel, artery or vein, or, both, by hemorrhagic or inflammatory exudate in the nerve sheath, due directly to empyema of an accessory sinus, or indirectly to orbital cellulitis, or to direct mechanical injury by a splinter of bone or callus in fracture of the base of the skull, involving the optic canal.

Paraffin injections of late are an added etiological factor, or rather were until their danger was recognized and the technique modified so as to minimize the possibility of this incident.

The clinical diagnosis of retinal embolism should not be made on the basis of the ophthalmoscopic examination alone. The general condition and the state of the heart should be taken into consideration. Rigid arteries, a history of apoplectic attacks strongly suggest local vascular disease. Differential diagnosis may be almost as difficult a matter clinically as it seems to be histologically.

Michel's criteria for a diagnosis of embolism are, occlusion by entrance of a plug into a previously free lumen of a vessel without diseased walls, a source of an embolus in the form of a valvular lesion or other recognized source, and the absence of signs and symptoms of thrombosis.

Raehlmann noted that veins, as well as arteries, were affected so that the disease process is properly an angio-sclerosis of the retina. He calls attention to the difficulty of determining whether the morbid changes, as due to atheroma from cardiac diseases, albuminuria, diabetes, acquired or congenital syphilis, diabetes, or merely to senility, either by ophthalmoscopic or microscopic examinations. Perivascular striæ may be due to sclerosis of most varied type. Haab considers them rare in simple senile sclerosis and thinks that white changes in the vessels in angio-sclerosis lead to the suspicion of albuminuria or syphilis. The main signs of arterio-sclerosis as described by Raehlmann, Friedenwald, Gunn, Hirschberg, and more recently and in detail by Coats, Bull, Wagenmann, Marple and many others, consist in extreme narrowing of the arteries with irregularity of calibre, tortuosity of small branches, particularly those supplying the macular region, dilatation of the veins, often associated with fusiform or sacculated varicosities, and visible changes in the vessel walls. These may lead to the formation of perivascular stria, which encroach on the wall of the vessel and gradually convert it into a bright white cord. At an earlier stage there may be merely a change in color of the cessel wall to a lighter hue than normal, with increased brightness and broadening of the central light streak, the "silver wire" artery. The increased rigidity and the pathological changes may not even be directly visible, but become evident only by indications of compression of a vessel passing underneath. This may lead to partial or complete constriction of a vein by an artery passing over it, or to flattening of the vein where the artery lies beneath. Often the size and shape of the blood column, or an interruption in its course, are the only indications of vascular disease. De Schweinitz notes uneven calibre and undue tortuosity of the arteries, increased distinctness of the central light streak, an unusually light color of the entire vessel, as *suggestive* of arteriosclerosis, while *pathognomonic* signs are presented by beading of the arteries, distinct loss of translucency, evident lesions in the vessel walls, such as perivascular striæ, irregularities of calibre in the veins, and, most important of all, constriction or indentation of the veins by the hardened arteries. As Marple says, "this latter symptom is recognized by all observers as the one ocular symptom most nearly pathognomonic of arterio-sclerosis."

Multiple hemorrhages of arterial or venous origin and of the most varied size and distribution are frequent accompaniments of these degenerative vascular changes, as might be expected, and may be so profuse as to appear clinically under the guise of a hemorrhagic neuro-retinitis of even a thrombosis of the central vein. Axenfeld and Elschnig, to cite only two of a large number of authors, have noted the frequent development of collateral anastomoses in the form of spindle shaped net works of capillaries, often associated with capillary hemorrhages, and speaking in favor of a gradually progressive obliteration of the corresponding vessel.

PULSATIONAL PHENOMENA.—Raehlmann first described a progressive venous pulse, which is visible, not only on the disc, but throughout the fundus. Immediately after the radial pulse, the vessel dilates rapidly and then slowly contracts, the collapse occupying most of the interval between the two pulsations. The fluctuations in calibre can often be followed along the whole course of the vessel in equal rhythm, the vein dilating to twice its normal calibre. At the same time the physiological venous pulse on the disc is missing. This symptom, like the capillary water-hammer or (Corrigan) pulse in aortic regurgitation, is an expression of the blood wave being carried abnormally far by high pressure into rigid arteries and distended capillaries and through them to the veins. Raehlmann states that this phenomenon is present in over 50% of the cases, yet Marple was unable to find it in even a single one of his.

GENERAL FUNDUS CHANGES.—Retinal haze has already been referred to. It is mainly due to edema, but in the presence of hemorrhages, effused serum may have something to do with the general blurring. The macular region is most apt to show opacity or infiltration. Other changes of a more sharply defined character follow the hemorrhages as an expression of tissue lesions produced in the process of absorption, or of secondary changes of a fatty nature. Pigment deposits may be observed, but as they are due merely to hemorrhage, and not to involvement of the pigment layer, they generally disappear in time. It may be very difficult to decide whether a markedly degenerated retinal vessel is still permeaable or not. If the red color is entirely concealed and the vessel changd into a uniformly white and glistening cord, there is no way of directly distinguishing it from a completely obliterated vessel. If the degenerative appearance is limited to a part of the course of the vessel and the red blood column appears beyond, we may safely assume that blood continues to circulate in the apparently obliterated vascular area. Complete obliteration may also be excluded, according to Leber, in case the corresponding veins show a normal blood column, as this would be impossible in case of complete interruption of the arterial blood supply. Preservation of function in the retinal section corresponding to the affected vessel would be valuable evidence and allow the same inference. Liebreich and Nagel have described a special method of oblique illumination with the ophthalmoscopic mirror in the upright image which enables one, unless the vessel wall has become entirely opaque or too much thickened, to determine the amount of blood in an apparently obliterated vessel. The light from the plane mirror is allowed to fall somewhat to one side of the vessel under observation, so that the rays do not strike it directly, and the vessel is in darkness until light from the neighboring brightly illuminated area to the side strikes through the vessel from the rear and so enables us to see the red blood column by transmitted instead of reflected light. "Just as deep-seated lenticular opacities may be seen through superficial deposits by means of focal illumination," says Leber. Liebreich has called attention to the following sign:—If there is a portion of red blood column between the disc and an apparently obliterated stretch of vessel, the outer contour of the white strand will be continuous with that of the red column in case the degenerated cord represents the solid contents of an obliterated vessel, but will be somewhat wider than the red column if it represents a thickening of the wall. In actual obliteration of any but the small arterial branch, the corresponding vein will show some evidence of disease in dilatation, abnormal narrowing, or irregular calibre, and not infrequently extravasation will be found in the area supplied by the diseased vessels as a sign of the marked disturbance of circulation.

Symptoms of Retinal Angio-sclerosis.—De Schweinitz claims that a certain type of persistent asthenopia, after presbyopia, is well established, in women who frequently present symptoms of neurasthenia, is frequently relieved by reducing high arterial tension. The writer (F.) has been a number of such cases in which the ocular symptoms, associated with throbbing headache, came on promptly after emotional excitement, particularly aggravation, and in which both symptoms were promptly relieved by lowering the blood pressure by the internal administration of nitro-glycerin.

As premonitory symptoms noticeable to the patient, Lamb (Ophthalmology, Jan., 1908) also mentions muscle tire with headache, scintillating scotoma and blurring vision or sight or prolonged blindness.

Suker (Lancet-Clinic, Dec. 22, 1906) has found that an application of adrenalin in incipient angio-sclerosis will facilitate the diagnosis by making tortuosities or irregularities of calibre in the conjunctival vessels more pronounced, or may even make an apparently straight vessel assume a beaded contour. Repeated applications of adrenalin to the eye may be dangerous for this very reason.

Disturbance of vision may not be noted in cases showing marked fundus changes in the form of obliterating endarteritis. Sudden failure of sight is generally an indication of hemorrhage or of complete obstruction of some large branch of the central artery or vein. Temporary obscurations coming on with cardiac weakness and temporarily relieved by cardiac stimulants, have been noted repeatedly and are generally ascribed to vascular collapse, and are no longer explained as cases of partial embolism. Complete blindness, unimproved by massage of the globe and administration of vaso-dilating, excitants, such as amyl nitrite or glonoin, would seem to indicate an obstruction depending on organized thickening of the vessel wall.

Reber notes as a differentiating system in favor of thrombosis as against embolism, besides transitory obscurations, simultaneous failure of vision in the fellow eye at the onset moment.

Significance of Ocular Lesions.—Marple found vascular changes in the retina sufficiently marked to allow a diagnosis of arterio-sclerosis in over 80% of his forty aged hemiplegics, between the ages of forty-one and seventy-four. Hirschberg's figures are 46% in fifty persons between the ages of 60 and 80. An interesting feature connected with vascular disease of the retina is the occurrence of temporary obscurations of vision, usually attributed to vascular spasm. A history of such attacks of transitory blindness is elicited in many cases in which complete obstruction finally took place in the form of embolism or thrombosis. The duration of such attacks may vary from a few minutes to hours, or even days, and Leber mentions a case in which they numbered 100 in one day. Transient diminution in calibre has been observed in epilepsy, migraine, in the cold stage of malarial fever, while in some toxic conditions, notably poisoning by quinine, great contraction of the retinal arteries is a prominent feature. The diagnosis of spasm has been generally made from the vessel appearing contracted and empty, the proximal side of the vessel being of normal calibre and the distal portion showing a continuous column of blood. The collapsed vessel may appear as a whitish streak. After some time a thin thread of blood may be detected in the portion which was previously empty, and later on the obstructed artery is found to have recovered its normal appearance. In these cases of localized spasm, there is nothing in the fundus to suggest embolus or thrombus, and neither could have passed away completely in so short a time. In most of the cases the whole artery was empty and refilled slowly. In Benson's, the small empty portion passed onward by a sort of peristaltic movement, while in Lundie's the still smaller empty portion remained stationary, and refilled gradually.

It is improbable that successive emboli from such a distant source as the heart or the aorta should all find their way into the same arterial branch and thus produce repeated partial occlusion with the characteristic obscurations.

Transient monocular blindness, due to vascular blindness, has been reported by Josey (Journ. Am. Med. Assn., 1902). Frost, Wagenmann (Graefe's A. f. O., XLIV.), Benson, Sachs and Harbridge, the last four having been able to observe actual spasm with the ophthalmoscope during the attack. Braunstein (Weston. Ophthlm., 1905, 4) reports no less than 15 cases of circulatory disturbances, which he ascribes to retinal vascular spasm. They were observed in nervous, exhausted persons, in consequence of weak heart action, following physical ovr-exertion or infectious disease, in hysteria and in excessive coitus or masturbation.

In arterial blocking seen at an early stage the possibility of transitory vascular spasm should be borne in mind ,and vigorous attempts made by massage, nitrate of amyl and other vasodilators to promote filling of the arteries. Attacks of transitory blindness suggest a search for constitutional disorders, which may predispose to the vascular spasm particularly retention of waste products. Wagenmann urges the performance of iridectomy in these cases.

It is possible that some of the cases reported as partial or incomplete embolism or embolism of a branch, improving promptly under treatment with amyl nitrate and massage, were not actual mechanical obstructionts, but vessel cramp. As these were the cases that recovered, there was, of course, no way of settling this point. In this connection, I want to point out a striking resemblance of these cases of intermittent or relapsing spasm of the retinal arteries to a similar occurrence in the vessels of the extremities in the cases of spontaneous gangrene.* It has been shown that this gangrene is due to arterioscleroseis and that transitory disturbance of function, as evidenced by limping, paraesthesias and fleeting but sharp pains along the limb, were frequent prodromal symptoms. The analogy with the retinal symptoms is certainly striking and one might almost be tempted to speak of intermittent claudication of the retina. As to the etiology of these cases, it is a significant fact that at Mt. Sinai Hospital there is never a time when there are not several of these cases in the wards. At the other New York hospitals they are very rare. Now, the patients are all Russian Jews, in early or middle adult life; they are males almost without exception, and generally tailors by trade. The deleterious factors at work here seem to be nicotine, tannin and theeine (these men live on tea and cheap cigarettes), possibly lead poisoning form the adulteration of the tobacco, and chronic traumatism of a low grade induced by the compression of the lower extremities and the interference with circulation incidental to the tailors usually sitting cross-legged.

Treatment of Embolism.—A recognition of the fact that the clinical pictures of embolism depends on general vascular disease must render futile our hope of any marked amelioration of symptoms by the administration of vaso-dilators or by the use of mechanical procedures, except, of course, in the unusual event of a pure embolism by paraffin, fat or air. The idea of mechanical massage of the globe as a possible aid in dislodging the embolus appears to have suggested itself to a number of clinicians at about the same time.* It has probably been used, one might say, as a routine, or rather as a forlorn hope in many a case of embolism, and it is safe to assume that many a case was not reported where it was no avail. Improvement of vision is so uncommon, and cure so exceptional, that we may be sure that every case in which this fortunate result was accomplished soon found its way into the literature. Digital massage was applied in the form of vibration of the globe through the closed lids by some, while others used a blunt probe, which was introduced and passed under the upper lid back as far as possible, stroking motions then being made so as to effect the tissues about the posterior pole and the optic nerve.

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*I find that I have been anticipated by no less an authority than Michel in calling attention to the striking similarity of the changes in the central artery of the retina with endarteritis obliterans of the lower extremities and their relation to spontaneous gangrene. He refers to Sternberg.

Schapringer (Centralbl. f. prakt. Augenh., Dec., 1906) believed that embolism, after attacks of coughing, in pertussis, and in hemorrhages from the stomach, was always due to entrance of a bubble of air into the central retinal artery and suggested the treatment used in caisson disease, which consists in putting the patient in a pneumatic cabinet and subjecting him to compressed air.

Hess reports a case in which the embolus, located in an upper branch, was seen to move when massage was employed. Vigorous treatment by this method was first applied within less than fifteen minutes after blindness came on. Vision was raised from counting fingers eccentrically at 4 meters to 8/x.

Reber used deep massage without any result in a case of embolism with blindness of 24 hours' standing, which had come on within 5 minutes. There had been frequent attacks of transitory blindness, in a female, aged 33. The clinical and ophthalmoscopic picture was that of embolism. In two other cases, both affecting females, aged, respectively, 52 and 60, deep massage was of no avail. Würdemann's four cases, two of which were completely and one partially cured by this procedure, were cited, but the author repeats Casey Wood's warning not to against ascribing to the treatment too much of the improvement, which so often follows, as not a few cases of partial and even complete embolism have recovered without any treatment at all. He concludes that about one case in ten is likely to profit by deep digital massage, and that the tenth case will have to occur in some young person. Still, deep massage should be tried in every case of embolism that is seen within 72 hours of its onset.

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*Würdemann suggested this procedure many years ago.

Etiology.—Gunn found vascular degenerative changes most frequently between the ages of forty and fifty, but they are not infrequently observed in much earlier adult life, and it is a question whether relapsing retinal and chorioidal hemorrhages in young subjects do not depend to some extent on juvenile arterio-sclerosis. As etiological factors in the causation of vascular disease, more particularly of the obliterating type, pathology has in recent years acquainted us with a number of constitutional affections hitherto unsuspected. Chronic intestinal auto-intoxication, abuse of alcohol, of tobacco and, possibly, of coffee and tea must be borne in mind, as well as the old established factors of syphilis, albuminuria, diabetes and rheumatic gout. Frequent or prolonged high arterial tension, due to excessive muscular exertion in athletes, or to the effects of repeated nervous or emotional strain, has a like deleterious effect on the vascular system. Even this does not exhaust the list, as lead and other metals used in many trades and often present as adulterants in various articles of diet, in tobacco and in fabrics, and a long list of drugs, tend not only to permanently raise tension, but eventually to cause actual alterations in the vessel walls. Hardly any age or occupation is free from these influences, but it is natural that the accumulated effect of all should make itself increasingly felt with advancing age, and this is one, at least, of the explanations of so-called senile changes. Senility is a matter of degree, and of histology rather than years, as indicated by the saying that a man is as old as his arteries. But how old are they? The arteries of a nephritic, a syphilitic, a rheumatic or gouty patient, or of one who habitually overindulges in tobacco, tea and alcohol may be "old" in the physiological sense of outworn and subject to organic and functional insufficiency at twenty-five or thirty. How are we to know when this is the case? Hard radials and tortuous temporal arteries may give us a clue, but not always. Premature grayness has been claimed as a significant symptom, indicating the first effects of diminished blood supply to the hairs. Coats says that angio-sclerosis depends upon the two factors of senility and pathological stimulus, and it is frequently impossible to decide their proportional representation. Fairly good arteries may give way before excessive strain, as instance the occurrence of retinal or subconjunctival hemorrhages after contusion, or after sudden rise in blood pressure, as in excessive vomiting, sneezing or coughing, which may never recur, and which do not progress, and are not followed by any grave intraocular lesions. Weak arteries may give way comparatively early under slight, inappreciable or undiscorerable strain, and give rise to spontaneous relapsing hemorrhages.

Heffron (The Senile Heart and Blood Vessels, N. Y. State Journ. of Med., Nov., 1908) gives an interesting sketch of the factors in arterio-sclerosis. The vessels are never at rest and high tension increases the amount of work; this is the prime factor. Acute infectious diseases of childhood, typhoid fever, even chronic tuberculosis, frequently cause arterial degeneration. Heavy labor is one of the most common factors, and this includes nervous and emotional strain. Gastro-intestinal intoxication, over-eating, free use of fluids, sluggish elimination and incomplete metabolism are of importance. Syphilis produces changes of a rather different type. Lead and alcohol are generaly believed to be dangerous. Many diseases, such as nephritis, diabetes and gout, are always associated with high tension.

Diagnosis.—Palpation of the pulse, the character of the first heart sound at the apex, and of the second sound at the aortic area, the sphygmogram, and the determination of both systolic pressure and diastolic tension by means of the sphygmo-manometer are important aids. Digital palpation may be misleading in obesity or vascular rigidity. In healthy young adults the systolic pressure varies between 100 and 140 mm., the diastolic between 80 and 90; 160 and 130 are, respectively, the upper limits of what can be considered physiological, even in advanced life.

Brunton (Blood Pressure in Man; Lancet, London, October 17, 1908) has observed the maximum pressure in children from 8 to 14 years of age to be about 90 millimetres, as measured with the Riva-Rocci armlet and Potain's aneroid manometer. From about 15 to 21 it varies from 100 to 115 or 120; from 21 to 65 years from 120 or 125 up to 135 or 150, and above 65 years of age it may still remain at this point if the arteries are still elastic, or it may go up to 180, 200, or even higher. In women, pressure is generally 10 to 15 millimetres lower, and in strong, athletic males about 10 to 15 mm. higher. In 10% of Janeway's 130 cases, hypertension would have been overlooked but for instrumental tests. In marked hypertonus, without evidence of sclerosis in the superficial arteries, splanchnic sclerosis or spastic hypertonus of the smaller arteries and arterioles, with or without renal changes, may be assumed.

It would be interesting and perhaps helpful to know if there are any characteristic external indications of arterio-sclerosis or of a tendency to this affection. Not all of us have a sphygmomanometer at hand and persistent high tension may be masked, as de Schweinitz has said, by obesity or other conditions, so that even the tactus eruditus of the experienced clinician fails to detect it. Some authors have claimed that the "apoplectic habitus" or older writers was the expression of angiosclerosis. Others say that the appearance most suggestive is found in the sallow, "dried up," nervous type, with a tendency to premature gray hair. There is a general, one might almost say a popular, belief among medical men in the significance of this last feature of early grayness. Has it any foundation? We see many young gray heads whose possessors have never had a sign of arterio-sclerosis and, unfortunately, but too many arterio-sclerotics whose hair pigment is quite in keeping with their age or with their youth, as the case may be. Again, what is premature? What is the correct age for a change to gray? Is this turning point the same for all? From a certain point of view it might be claimed that turning gray is a sign of disease at any age, and the only practical question would then be, how far does it dictate progressive vascular degeneration or of what significance is it for continued health and life, and diminution of blood supply?

Prognosis.—The effect of retinal hemorrhages on vision will depend largely on their extent and location. If extensive and central, they may cause marked blindness. The remote results are rupture through the hyaloid with the formation of vitreous hemorrhages, proliferating retinitis, glaucoma and detachment, all of which may lead to complete blindness. Numerous instances of these types as secondary complications of angiosclerosis of the retina are on record.* Gunn thinks that lenticular opacities and certain cases of retro-bulbar neuritis, as well, are due to degeneration of the retinal vessels and of those of the axial fibres of the optic nerve. Various toxic forms of amblyopia, such as the retro-bulbar neuritis due to alcohol and tobacco, to lead and to other poisons, to which we may add wood alcohol, are believed by not a few investigators to be due less to primary toxic degeneration of nerve tissue, to circulating toxins or other deleterious soluble substances than to the interference with circulation in the nutrient vessels of small calibre, which is caused by endarteritis of toxic origin. It is possible that the first effect of these toxins on the vessels is the production of a more or less prolonged spastic contraction, similar to the spasm of the bronchioles when irrespirable gases are inhaled, or to that caused by adrenalin, and that the relaxation of this spasm under appropriate treatment may, in part, account for the marked improvement in vision occasionally noted when early and vigorous treatment is instituted. I have in mind more particularly de Schweinitz's series of cases of tobacco-alcohol amblyopia, which showed such marked progress when the intestinal tract was cleaned out and the ingestion of the poisons stopped. It is questionable whether an actual degeneration of nerve tissue would recover under similar regimen.

In the section on senile angio-sclerosis, Haab notes Thomas' conclusions that the internal cartoid and its area of distribution are especially prone to attacks by these degenerative processes, while sounding a note of warning as to the precept that the retina is to be considered a part of the brain, to the extent that retinal hemorrhages and vascular lesions indicate grave danger of like occurrences in the cerebral vessels. "The most important work in support of such a view has still to be performed, and must be done with the microscope, as with the ophthalmoscope but little is to be relatively seen."

Still we must remember that in over 22% of the 44 cases reported by Raehlmann, there was subsequent cerebral hemorrhage, also 14 cases reported by Gunn (Trans. Ophth. Soc., U. Kingd., 1898).

Gunn and de Schweinitz think that arterio-sclerotic changes are of greater prognostic significance in renal sclerosis than retinitis itself, as the latter does not invariably develop, or the case terminates fatally before nephritis is fully established. Cerebral apoplexy often occurs in a comparatively short time after the discovery of these retinal vessels changes.

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*Krueckmann (Opth. Soc., Heidelberg, 1906) classes the retinal change in chronic nephritis, in diabetes, as results of arterio-sclerosis and in circinate retinitis.

Straub (Klin. Montsbl. f. Augenhlk., 1908, p. 517) reports the subsequent history of cases of retinal hemorrhages due to arterio-scleerosis treated for visual disturbances five years or so previously. All were of the better class and in good general health, and had neither albumen nor sugar in the urine. The retinal lesion was probably venous thrombosis. The ages ranged from 32 to 77; most were between 45 and 65, corresponding with figures of Coats and Harms. Of all 36 cases, only 10 were in females. Both eyes were affected in 5 of 15 cases, but vision was never seriously diminished in both; 6 cases had apoplexy. Of 9 cases in the most predisposed age, 50 to 65, only 3 were still alive; 5 died in 5 years, 1 in 3 years, 2 in 2 years and one in 3 days. Prognosis seems to be relatively favorable as regards life in the comparatively old and rather young subjects.

In regard to the common sequel of glaucoma, Ischreyt has pointed out that only those cases in which glaucoma ensues come to enucleation. More important than the frequency of the glaucoma is the fact that in every case but one it was monocular. Acute symptoms may not occur until glaucoma has reached an advanced stage, as indicated by deep cupping. Verhoeff thinks that in these cases the obstruction was secondary to or independent of the glaucoma.

The predisposition to intraocular hemorrhage must be considered in this connection as an important factor in the prognosis and in the judgment of the value of iridectomy. The operation is apt to be followed by intraocular hemorrhage, and the eye is not infrequently lost.

Dunn has recently called attention to the practical value of the sphygmomanometer in this connection. The higher the tension, the more apt is iridectomy or, in fact, any major eye operation, to be followed by serious hemorrhage, and the more grave is the prognosis for improvement of vision, and the more likely is the use of mydriatics to be followed by the onset of glaucomatous symptoms.

Treatment will vary with the age of the patient, the nature of the lesion, and the severity of the type. It has to do primarily with the habits of life, more or less modified by the patient's environment and condition, but is also largely dietetic; medication is relegated to second place in importance. (Bull.) Rest of body and mind is the first therapeutic requisite for the aged; the reform on the table is the second. Diminish an over-generous appetite, and cut out meat broths, extracts and teas and soups. Some fruits, as apples, pears and grapes, are beneficial. Coffee and tea must not be takn strong or in large quantities. The same is true of alcohol. Fluids should be restricted. Chilling of the body must be avoided, and the aged must be warmly dressed (Heffron). Nitrites and iodides to diminish pressure to keep it low, saline cathartics to unload the bowels and to reduce the volume of the fluid in circulation, alkalies to counteract the accompanying acidosis are the most important drugs.

# PREALBUMINURIC RETINITIS.

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The title of this paper was suggested by the fact that the conditions found in the retina are essentially the same as those described as albuminuric retinitis, but they antedate the appearance of albumen in the urine many weeks, or even months.

The object of this paper is to present for your discussion the assertion: that chronic Bright's disease is not a renal disease any more than diabetes is a renal disease, although it frequently gives rise to kidney lesions; that it is primarily a chronic inflammation of the arterioles and capillaries of the general circulation, which has been called arterior-capillary-fibrosis, a hyaline-fibroid change in the vessel walls which leads to thickening and loss of elasticity; caused by a poison or set of poisons of which we as yet know very little; that such kidney lesions as may and do appear in the course of the disease are incidental and not essential.

The essential lesions are certain degenerative changes affecting many tissues and are widely disseminated.

A degeneration, strictly speaking, is the conversion of a normal tissue into one of a lower type, which is incapable of performing its normal functions: which may result from an immediate change in its component parts, or from a molecular absorption of its structural elements and their replacement by others lower in the scale. But the term degeneration is also applied to certain pathological processes in which a new material derived from the blood is deposited in the midst of the original elements of a tissue, which frequently leads to their absorption and may ultimately replace them entirely.

Chronic Bright's disease would seem to belong to this latter class of degenerations. The pathology of the cases grouped under the general term of Bright's disease has been, and still is, the subject of much controversy, as is also the pathology of arterial degeneration. The etiology of these associated conditions has also, until recent years, been the subject of much controversy and still remains somewhat obscure, although the study of intestinal putrefaction with its consequent autotoxemia seems to be leading us to some definite conclusions. As long ago as 1870 Professor Roberts of the University of London, after enumerating six probable causes for Bright's disease, gives as a doubtful seventh "prolonged intestinal indigestion."

Delafield, in lecturing on the kidneys, says: "There is a group of persons who are more liable than others to chronic productive inflammations in different parts of the body. Unquestionably many of these persons are gouty. * * * In some there is a history of heredity, many of them suffer from disturbances of digestion, etc., etc. So great is the number of these cases and they are so constantly under observation that we can predict beforehand that a given individual will at some time develop endocarditis, endarteritis, emphysema, cirrhosis of the liver or chronic nephritis. It is possible that this group of persons are really all suffering from the same disease, and that they develop the characteristic lesions as a result of the disease. According to this view, a person can have chronic Bright's disease while the kidneys are still normal. * * * It is quite true that most of them do have disease of the kidneys before they die."

It was formerly conceded and accepted as an established fact that there are two distinct types of chronic nephritis, which are not related to each other nor modified forms of each other. One, the large white kidney, was supposed to be entirely a parnchymatous inflammation and was always accompanied by albuminuria and dropsy; the other, the small red kidney, which was supposed to be entirely an interstitial inflammation with little or no albumen in the urine, and no dropsy. This view I believe is not now very much in vogue, modern pathologists contending that all of them show, to a greater or less degree, both interstitial and parenchymatous inflammation.

In this connection, I again quote literally from Delafield's lectures, "Bamberger,, from a study of 2,340 cases of chronic nephritis, exclusive of chronic congestion and amyloid degeneration, concludes that: in all the large smooth kidneys with thickened cortex there is a growth of interstitial connective tissue, atrophy of the glomeruli and thickening of the arteries; that there are cases with history of hypertrophied kidney, but at the autopsy the kidneys are found to be atrophied; that there are cases also with mixed histories of both large white and atrophied kidneys."

This is, to my mind, rather confusing as to the different types of Bright's disease, but there is no confusion or controversy as to the association of degeneration of other tissues (principally the arterioles and capillaries) with all types of Bright's disease.

De Schweinitz, writing on the pathology of so-called albuminuric retinitis, says: "The alterations in the vessels are the important factors in the pathological changes. Formerly it was believed that the retinal changes were secondary to a kidney lesion, which was regarded as the primary disease. Investigations of Von Michel, Karl Theodor, Weeks and others all go to show, however, that the process in the retina and in the kidneys has the same origin. In other words, the same causes which originate disease of the blood vessels of the kidney, originate also the alterations in the retinal vessels, and to these alterations the chief role must be ascribed in causing the various types of retinal lesions." "Von Michel has gone even further and stated that the ophthalmoscopic picture of so-called albuminuric retinitis is entirely the outcome of disturbance in the circulation and of lesions of the retina brought into existence by a primary disease of the vessel system of the central retinal artery and vein; that is, of arterio- and phlebosclerosis with their sequelæ." De Schweinitz says further: "It is interesting that a number of observers have noted sclerotic changes in the vessels of the chorioid analgous to those which are found in the retina."

There is the whole thing in a nutshell. The group of cases which we call Bright's disease is not simply a disease of the kidneys, but it is a complex manifestation of a general toxemia. We are familiar with the very rapid degeneration of tissue cells which occurs as a result of the toxemia of diphtheria, and I look forward hopefully to the time when the nature of the toxemia which we call Bright's disease will be equally as well understood.

The retinal picture of so-called albuminuric retinitis is so well known that I will not take up your time with a detailed description of that condition, but will enumerate its essential features, the most prominent of which are variously shaped and placed white spots, usually forming around the macula a star-shaped arrangement; and linear, flame-shaped hemorrhages along the course of the blood vessels, which may be in any or all of the layers of the retina. The retina is usually quite lazy, the veins enlarged and tortuous, while the arteries are unchangd or contracted; there may or may not be swelling of the nerve head; there is always more or less diminution of vision. The condition which I have called prealbuminuric retinitis differs from this in degree only, and, in my opinion, is merely an earlier stage of the same condition. There are no white spots, no perceptible changes in the blood vessels, and no haziness of the retina unless there should be swelling of the papilla (which was present in one eye in my second case and was limited to the papilliary area.) The hemorrhages when present are flame-shaped and lie along the course of the arteries; they are decidedly transient, at times disappearing in a marvelously short time ,leaving no trace of their presence; they are very faint and easily overlooked; there is no diminution of vision and the condition is invariably discovered by chance. In the three cases which I have to report, it was discovered during routine examination, neither of the patients knowing or suspecting that they were suffering from this disorder.

The first and most instructive one, Mrs. B. of Savannah, aged 40, married, two children, apparently healthy, history negative with the exception of chronic indigestion existing for an indefinite time; came to be examined for glasses October 10, 1900. The condition described as prealbuminuric retinitis was discovered and the patient, together with her husband, was warned as to the probable result. There was no albuminuria, no casts. She was kept on milk diet for some weeks, during which time the lesions all disappeared. She tired of the diet and I lost sight of her for two years. In December, 1902, her husband told me that she had just completed a pregnancy, during which time she had suffered from dropsy and had lost the sight of the left eye. April 2, 1903, she came to my office for examination. The right eye showed some white spots, no hemorrhages, vision 20/xx; left eye typical albuminuric retinitis, vision 20/cc; no albumin in urine at that time, but numerous hyalin casts. She was at that time under the care of her physician; I did not see her again, but I learned from her husband that she died from puerperal eclampsia in 1904.

The second case, Mrs. V., aged 30, from South Florida, a robust, healthy looking woman, married, no children, had never been pregnant, history negative excepting chronic indigestion, from which she had suffered for years and for which, as she expressed it, she had taken barrels of medicine, consulted me for pterygium November 5th, 1907. The condition described as prealbuminuric retinitis existed in both eyes, but more pronounced in the left, which showed also slight swelling of the nerve head. Repeated examinations of the urine revealed no albumin and but three hyaline casts were found after repeated examinations. She was warned as to the probable trouble, placed on milk diet for some weeks, but became dissatisfied and went home. She afterwards wrote to Dr. Waring, my associate in the case, that she had had her urine examined by a competent man in Atlanta, who reported that she did not have and never had had Bright's disease. I have no further record of her case.

The third case, a man 47 years old, a retired iron foundry man, apparently robust and well preserved, had suffered from chronic indigestion all his life and had been sent south from a northern New York city on account of chronic rheumatism, consulted me January 12th, 1908, for slight iritis. The condition of prealbuminuric retinitis was quite well marked in both eyes; no albuminurea, no casts. He was placed on a strict milk diet and both the iritis and retinitis promptly disappeared. I have heard no more from him, as he returned to his home about April 1st.

One cannot help being impressed with the so-called chronic indigestion in each of these cases; and what does that imply? The answer seems plain. Intestinal putrefaction—the seventh doubtful cause of chronic Bright's disease.

# ON INTRA-OCULAR DISEASE BROUGHT ON BY DISEASE OF NASAL SINUSES.

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CHICAGO, ILLS.

Numerous observations, mainly within the last twenty-five years, have proven that diseases of the nose and particularly of the nasal sinuses may lead to a variety of eye affections. The most common instances are those in which there is no actual ocular lesion but merely symptoms referred to the eye. Obscure pains in and around the eye and obstinate asthenopia are in some cases due to suppuration of some one nasal sinus and cease after its successful treatment. Less common are actual lesions of the ocular adnexa of nasal origin. It is only in diseases of the lacrimal passages, stricture and dacriocystitis, that a nasal origin is the main etiology. It has been shown by many observers that the large majority of lesions of the lacrimal passages are due to ascending infection from the nose, while but in a small minority the cause is descending disease starting in the conjunctivia.

In a manner less clearly understood but surely shown by clinical results, nasal suppuration, especially in the presence of adenoids, is often an important factor in the production and perpetuation of phlyctenular or scrophulous keratitis.

As the orbit is largely surrounded by the different nasal sinuses, it is not surprising that sinus disease should extend frequently into it. According to Birch-Hirschfeld's statistics of 684 cases of various forms of orbital inflammations, practically 60% were traced to primary disease of some nasal sinus. This proportion would be found even larger had a thorough nasal examination been made in all instances. Orbital disease can of course involve the eye secondarily; amongst 409 cases collected by Birch-Hirschfeld there occurred corneal ulceration 18 times, panophthalmitis 8 times and glaucoma twice. These accidents, besides direct involvement of the optic nerve, made 66 eyes blind in the series of 409 orbital inflammations due to extension of sinus disease.

The optic nerve may besides become affected by direct extension of disease from the posterior ethmoid cells or the sphenoid sinus without orbital involvement. We again owe to

Birch-Hirschfeld a collective study of such cases. By their analysis he showed that in those instances in which there is no optic neuritis visible with the ophthalmoscope the characteristic symptom indicating involvement of the nerve secondary to sphenoid or ethmoid lesions is a small central color scotoma. Quite a series of cases of optic neuritis either purely retrobular or extending visibly into the papilla have now been traced by different observers to disease of the posterior nasal sinuses. Still it seems to me that after all, this occurrence is not a frequent one when we compare the isolated reports in literature with the great frequncy of inflammatory affections of the optic nerve. Although I have examined rhinologically every case of optic neuritis in my practice for a number of years, I have never met with an instance of this kind.

A problem quite different from these instances is the question whether sinus lesions may lead directly to any form of intra-ocular disease and whether the contents of the eye ball may become affected without a visible path, so to speak, of disease from the sinus to the eye. Ziem, a pioneer in the study of sinus disease, especially of the maxillary sinus, has contended that such occurrences are possible. In his various publications he speaks of recurrent or chronic iritis, of cyclitis and of glaucoma-like attacks as a possible complication of sinus suppuration. His cases, not always given in detail, are, however, not convincing from the ophthalmic point of view. Various observers, like Kuhnt and others, who have paid much attention to this relationship, admit that they have not seen such instances. Kuhnt thinks that sinus suppuration may exert an unfavorable influence on cyclitis and chorioidal disease, but does not claim that they are brought on in the first place by sinus lesions.

I have personally seen several cases of recurrent iritis associated with ethmoid suppuration, but in every one of them a gonorrheal origin seemed more likely from the history and none of them were followed ultimately after treatment of the ethmoid suppuration. They were hence not conclusive.

I wish to present to-day the history of four cases of chorioideal disease with more or less involvement of the retina which were associated with sinus disease on the same side. It cannot be said of any one of them that the etiological relation of the sinus disease to the intra-ocular lesion is absolutely proven, but the similarities in the clinical picture make such an assumption probable. Besides in two of them (cases III and IV) the fluctuations in the course of the eye-disease correspond more or less with the free or inpeded drainage from the sinus. An absolutely convincing proof could only be furnished by a case in which the eye-disease, hitherto progressive, yielded promptly to operation on the affected sinus. Case III comes near this ideal, but for the fact that in such a typical form of disease the prognosis is never absolutely positive.

The following are the histories in brief.

Case I. Acute transient Central Chorioiditis during the course of acute maxillary empyema.

Miss D. 17 yrs. Perfect health. Since two weeks the left eye has been failing and the left pupil enlarging. Has had no pain except left sided occipital headache last week. The left upper second bicuspid tooth has been bad and for about a week she felt a tender cord running under the cheek from that tooth toward the orbit. She had the tooth pulled yesterday.

R. E. normal.

The left eye counts fingers at one to two feet but has perfect visual field. There is slight dusky congestion of the sclera. Tension is normal. The slightly enlarged pupil is mobile. The cornea is densely dotted on the posterior surface. The iris, grayish blue in the R. E., shows a greenish discoloration, but reacts fully to homatropin. Beyond the existence of membraneous shreds in the vitreous nothing could be learned by ophthalmoscopic examination. The dental history as well as the one-sided nasal stuffiness and suppuration suggested disease of the left maxillary sinus. On opening the latter through the alveolus of the extracted tooth fresh odorless pus was found. The antrum was washed out. No internal medication.

The next day she felt clearer in the head and sight of L. E. is clearer, although fingers are not counted beyond 2 feet. The sclera is pale. Ophthalmoscopic reflex brighter. Irrigation of antrum. Atropin in eye.

Steady improvement now set in.

As the vitreous cleared the papilla was seen to be normal. Later it became possible to recognize a central patch of white choroidal exudate about one sixth papillary diameter. As this cleared, the corresponding retinal area developed stippling with pronounced mottling beneath it. The ultimate sight reached in two months was 15/xl. This remained the same one year later when the only visible lesion remaining was atrophy of the formerly inflamed chorioidal area with a pigmented fringe.

It took about 10 weeks before the suppuration of the antrum ceased completely under irrigation and boric acid insufflation.

This case is a clear instance of the form of self-limited central chorioditis or chorio-retinitis which I described as a separate type in 1893 in the Annals of Ophthalmology and Otology. Subsequently A. Hill Griffith gave a similar description of this form of chorioiditis (Chorioiditis with Descemetis) in Norris and Oliver's System of Dis. of the Eye. Of 20 instances of the disease which I have watched throughout the whole course this is the only one in which there was coexisting sinus disease. Since no definite cause or origin of the disease could be learned in any of the cases, the sinus etiology in the present instance is a probability suggested by the history. The clearing of the cloudy vitreous and the absorption of the chorioidal exudate proceeded at the same rate as in other cases of similar severity, but not associated with antrum disease observed at different times and were probably not influenced by treatment of the antrum.

Case 2. Acute Central Chorioretinitis associated with subacute or chronic maxillary empyema.

Mr. K. 28 yrs. of age. Good health. One week ago dimness of the right eye. No specific history. For some time (months?) slight purulent discharge from the nose, especially from the right side, but has not been annoyed by it.

L. E. normal in every way.

R. E. externally normal. Pupil normal. Vision:—fingers counted at four feet. Field normal. The ophthalmoscope shows a mist over the nasal half of the papilla extending beyond the border and plainly due cloudiness of the adjacent vitreous as otherwise the papilla and its vessels were entirely normal. The center of the retina is grayish turbid, especially toward the nasal side of the macula without well defined border around the infiltrated area. Below the macula there is a minute faint pigment spot.

On examining the nose the septum was found slightly bent toward the right side, but without producing any decided stenosis. No pus was seen, but on irrigation distinct purulent masses appeared, mainly from the right side. Translumination showed the right antrum distinctly darker than the left.

The treatment consisted of small cathartic doses of calomel every second day, locally dionin, and after the first week subconjunctival injections of salt solution (2%) about twice a week. An immediate improvement of sight was observed after the first dose of calomel and in one week vision had reached 20/c. After three weeks he had vision = 20/lxx.

As he now resumed traveling, the treatment was reduced to the use of KI.

About the sixth week the permanent condition was reached with sight equal to 20/l plus. The haze over the nasal side of the papilla had begun to diminish at once and was gone inside of three weeks. The cloudiness of the central area receded at the same rate and after the sixth week the only anomaly to be seen was a very faint pigmentation below the fovea.

In view of the certain diagnosis of empyema of the right maxillary sinus the meatus was treated with adrenalin and the douche was employed regularly. At the second visit the attempt was made to puncture the right antrum through the middle meatus. No fontanelle was found and the bone was so thick that it could not be perforated by the needle. Three days later I again attempted to puncture the antrum by means of a trocar beneath the inferior turbinal. Again an unusually thick bone was met with and the attempt was not successful. As the empyema was not of dental origin and the nasal discharge had diminished under treatment while the eye condition had decidedly improved, the exploration of the antrum was deferred at the patient's request. By the end of six weeks there was no nasal discharge. Meanwhile transillumination had shown a gradual clearing of the right antrum until it appeared of normal brightness. Two months later the eye and the nose were found in the same condition as they had been after the sixth week of active treatment.

While the principal lesion seemed to be a central retinitis I must consider this secondary to a chorioidal lesion in view of the vitreous haziness and the ultimate faint pigmentation of the affected area. Whether the subacute or chronic maxillary empyema was the starting point of the eye lesion cannot be decided by observation. From experience I should expect this case to have recovered as it did under treatment directed to the eye. But of course I could not say whether the treatment would have been as successful in this instance if I had neglected the antrum. The diagnosis of maxillary empyema as well as its ultimate disappearance were fully established by transillumination. The nasal wall of the antrum was so unusually thick that having failed to penetrate it I did not make further attempts in view of the steady diminution of the nasal discharge. The complete cure of the antrum suppuration without artificial opening was rather unexpected in suppuration that existed no doubt many weeks or longer.

Case 3. Neuro-retinitis with Uveitis associated with Maxillary Empyema and improving only after drainage of the Sinus.

Mrs. C. 35 yrs. old. History of normal health except for frequent headaches, especially on the left side, which were said to have been relieved by some treatment of nasal catarrh. She has a slight purulent discharge from the nose, especially on the left side. Since nearly four months she has noticed a flickering of the left eye with gradually increasing dimness.

R. E. normal and normal sight.

L. E. externally pale. Very faint but distinct minute deposits on posterior surface of cornea. Pupil slightly enlarged and not freely mobile. Vitreous clear. Papilla veiled with effaced edges, the zone of cloudiness extending into the retina in the form of an irregular triangle from the disk to beyond the macula with the cloudiest portion just below the macula. Between the disk and the macular region but below the retinal infiltration there is a zone of fundus pigmentation in the form of a faint dark cloud-like figure. Vision=20/lx, but with a faint relative scotoma upward from the point of fixation.

Inspection of the nose showed no anomaly except a small amount of pus in the middle meatus on both sides but especially on the left. Transillumination showed scarcely diminished brightness. After cleansing the nose with a douche I punctured the left antrum through the canine fossa and washed out a plug of odorless purulent mucus.

Several of her upper lateral teeth were poor and broken off but had given her no discomfort. She was put on bichlorid of mercury and on gram doses of K. I.

One week later the objective and subjective conditions were unchanged, but she thought that her sight was clearer the day after the puncturing of the antrum.

The stump of the second bicuspid tooth was now extracted, but found healthy. Through its socket the left antrum was opened widely and a plug of purulent mucus was washed out. Irrigation through this fistula was kept up daily. The eye condition began to improve. In two days the flickering and dimness were less noticeable, while objectively the papillitis and cloudiness of the retina diminished. As the cloudy retinal area cleared up, small white stripes and dots became noticeable within this zone, but disappeared ultimately.

The subjective and objective improvement continued steadily in the next few weeks, although the internal use of mercury and K.I. was discontinued. During a few days' absence and interruption of irrigation the pus became more abundant in the antrum and the sensation of flickering returned.

Five weeks after the antrum had been punctured the sight seemed almost normal to her with an acuity=20/xl plus. The corneal deposits had disappeared. The retinal infiltration was very much diminished, but within the formerly clouded zone there was now a lattice work of exceedingly fine white lines. The optic disk had become normal. The pigmentation below the cloudy zone was of course unchanged. A new lesion now visible were two small transparent membranous protrusions from the retina into the vitreous. There was still a slight discharge from the antrum. She was told to continue irrigation, as she left the city permanently. About ten weeks subsequently she wrote that she had recovered her sight fully, but did not refer in her letter to the discharge from the antrum.

This case would ordinarily be called neuroritinitis of low degree. The papilla was not swollen and the vessels were not abnormal. It is perhaps an open question whether the veiled appearance of the disk was not entirely due to haze in the vitreous over it, without actual neuritis, although there were no opacities in the vitreous except where it covered the papilla. The infiltration of the retina was, however, distinct beyond question. But in this case, too, we must assume chorioidal disease and we may even call it uveitis on account of the Descemetian deposits, the slight enlargement and sluggishness of the pupil and the distinct chorioidal pimgentation below the zone of retinal cloudiness. In fact I am now even inclined to attribute the appearance of a low degree of papillitis to vitreous haze and hence to a chorioidal lesion rather than to a real inflammation in the nerve. The subjective symptoms, dimness and flickering had lasted about four months and were not influenced by one week's treatment with mercury and K. I.

Within two days after opening and irrigating the antrum both objective and subjective improvement were noticeable. During a few days' neglect of antrum treatment the flickering increased again. The regular continuation of antrum treatment without further medication resulted in complete disappearance of active disease within the eyeball. Whether the suppuration of th antrum itself ceased completely I did not learn.

Case 4. Isolated patch of Peripheral Chorioiditis-recurrens associated with Sphenoid or Posterior Ethmoid Suppuration and aggravation of Eye Symptoms by a tampon interfering with drainage.

Miss H., apparently in normal health, complained in April, 1903, of aching in the left eye with blurring and floating specks and a few days later of more or less headache on the left side. She called on the 12th day with the sight of the left eye reducd to 20/c, the vitreous slightly cloudy, especially over the disk, and a small white area of exudative chorioiditis in the nasal lower quadrant. F. V. normal and no central scotoma. She was given calomel and antipyrin for the relief of her pain. She reported relief after a few days and then staid away. My notes do not show that her nasal condition was either mentioned by her or investigated in 1903.

She returned in February, 1908, and claimed to have recovered entirely. Two weeks ago she had had again shooting pains, blurring and floating specks on the left side coinciding with an acute cold in the nose.

R. E. normal.

L. E. vision=20/lxxx. V. F. normal. No scotoma.

Vitreous cloudy over the disk; optic nerve normal, but the retinal veins quite full (which my notes also recorded in 1903). The former patch of chorioiditis was now indicated by a chorioidal atrophy with pigment fringe, while beneath it was a small area of recent white infiltration.

The history of an acute coryza preceding the pain and blur suggested an examination of the nose. She admitted on closer questioning that she had had more or less nasal obstruction and purulent discharge for many years, certainly for some time prior to her attack in 1903, and that the annoyances were more pronounced on the left side. Inspection showed acute swelling and discharge of a fresh coryza with some hypertrophy near the posterior ends of both right and left middle turbinal. The septum, practically straight in front, bulged very much toward the left side in the rear and upward, reducing the space between it and the middle turbinal to a narrow chink. The nose was treated with adrenalin and the douche and she was given calomel every second night.

Even the next day, sight had begun to improve and the blur of the fundus due to the cloudy vitreous diminished. Within a few more days her sight reached 20/xxx plus and the fundus showed as only lesion the area of fresh chorioidal infiltration now clearing rapidly.

For the first three days the nasal treatment was merely palliative. As the acute coryza subsided I snared off a flat polypoid hypertrophy on the median side of the rear end of the middle turbinal. I did this first on the right side, which relieved that side permanently of its obstruction. There remained, however, a scant purulent discharge coming from the rear upper recess of the right side of the nose, either from the sphenoid sinus or a posterior ethmoid cell. This discharge gradually dwindled down to a mere trace. The difficulties on the left side were much greater. The bulging of the rear upper area of the septum interfered with inspection as well as the use of instruments. The snaring off of a flat growth from the inner side of the middle turbinal improved temporarily both the obstruction and the discharge of pus. After waiting a couple of weeks longer and finding the discharge and swelling returning with a suspicious feeling to the probe of exposed bone I removed as far as possible the rear end of the middle turbinal with chisel and forceps. The anterior sphenoid surface was still not visible. The tendency to recovery from the discharge which was most probably of sphenoid origin was interfered with by the springing up of granulations which required removal from time to time. An attempt to clear away all obstruction up to the sphenoid made on the 17th of June caused sufficient bleeding to require the use of a tampon. Through a misunderstanding, the patient did not return to have the tampon removed for three days, but now came with the history of fresh blur over the left eye. Her sight, which had been 20/xx minus, had fallen to 20/xxx minus and there was an unmistakable blur over the inferior nasal border of the disk. The chorioidal infiltration, which had nearly disappeared by this time, leaving of course an atrophic spot, had not been influenced. The removal of the tampon was followed by the immediate disappearance of the eye symptoms and restoration of nearly perfect sight.

The nasal discharge considerably reduced, did not diminish beyond a certain degree. With the assistance of Dr. Stubbs I then chiselled off submucously the thickened and deflected area of the vomer in front of its junction with the sphenoid. Within the next six weeks the discharge from the left side diminished further, but as on account of the still existing tortuosity of the passage, the sphenoid can neither be seen nor reached with certainty no other operative step has been taken and the purulent condition is not yet cured, although the patient is free from all annoyance.

The present case is perhaps the most suggestive in the series. When seen in 1903 it was a well defined case of fresh exudative chorioiditis in the form of a single circumscribed patch in the nasal quadrant. Although there was no recognizable papillitis, the vitreous haze covering the disk and not extending beyond this area proved an associated disturbance in the nutrition of the nerve-head. The left-sided pain and headache were not due to the chorioiditis, which causes no such symptoms. The nasal origin was at that time not investigated.

Five years later there recurred an identical attack with fresh infiltration of another chorioidal area. This time the nasal origin which I should have thought of in 1903 by reason of associated pain was suggested by the history of a fresh coryza preceding the eye symptoms. The patient was sure that the discharge and stuffiness of the nose existed long before the previous attack and that her left side has always been the worst. In the present attack as in the previous one the nasal origin is strongly suggested by the left-sided pain and headache brought on by a fresh coryza and culminating in dimness and flickering of the left ye. Again the attack was self-limited and the nasal connection could not have been shown by any even more energetic surgical treatment. But the strongest hint as to the relationship is furnished by an accidental observation. A tampon left in the upper rear recess of the nose for three days caused not only discomfort in the temple but dimmed the sight, which had been nearly perfect, and brought back the haze over the optic disk that had been normal a few days before. The withdrawal of the tampon was followed within a day by the disappearance of all disturbances.

The sinus involved is either the left sphenoid or the posterior ethmoid cells. The bulging of the septum made a localizing diagnosis impossible and even after the deflected and thickened vomer had been chiselled away the sphenoid surface could not be brought into view. As the posterior end of the turbinal has been gradually taken away completely nothing short of removal of the rear upper part of the septum will permit a full view and exact diagnosis. At any rate it is a suppuration of an accessory space in the rear of the nose with the drainage formerly entirely insufficient and even now not yet satisfactory.

Through which channel the infectious matter reached the interior of the eye in the present or in the other cases is not clear and there are not enough clinical data on which to base a full explanation. It is noteworthy that in every instance there was haze of the vitreous adjoining. Haze was especially emphasized in case IV by its prompt reappearance when the discharge was pent up by a tampon. In cases I, II, and IV, the ocular lesions were of self-limited duration. Their course was presumably not influenced by the treatment and the rate of resolution was about the same as in similar instances of acute chorioiditis or chorio-retinitis not associated with sinus disease. In case III, however, the symptoms had arisen more gradually and had shown no tendency to subside until the maxillary sinus was drained.

# FIBROMA OF THE SCLERA.

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Primary tumors of the sclera rarely occur, says Fuchs[1]. Cases of fibroma, sarcoma and osteoma have been reported. As to fibroma I was only able to find one single case in the literature which Saemisch[2] described some 30 years ago:

Saemisch enucleated the eye of a girl 10 years old; it contained an extraocular and intraocular tumor supposed to be glioma. The state of the eye, the rapid development of the growth as well as the age of the patient, all spoke in favor of this diagnosis. Upon examination, however, it proved to be a fibroma of the sclera which had rapidly increased in size and was located on the external surface of the sclera to the inside of the optic nerve. The tumor measured 10 to 8 to 5 mm. Five years later no recurrence had happened. The internal coats of the eye were involved in his case and there was detachment of the retina.

My case bears some resemblance to this case, especially as to age of patient and rapidity of growth, also as to size and qualities of the tumor. The rareness of such cases may be sufficient excuse for my publishing it:

M. B., a girl 14 years old, came to my dispensary 1½ years ago with her mother; both stated that the girl's eye-sight was growing weaker, especially in reading in school, since about 6 weeks. She was a tall, healthy looking girl with symmetrical features. The refraction was emmetropic, her eye-sight perfectly normal.

The right eye was about 1 mm. lower than the other one, but there was no apparent limitation of motion in any direction. Upon asking her, the patient confessed seeing double while reading; the diplopia was nearly characteristic for a paresis of the inferior rectus, but there was also some diplopia in the upper field.

If the patient looked up as far as possible and the lower lid was everted, a slight protuberance was noticeable in the lower fornix; it felt very hard and could not be removed from the sclera, nor was the conjunctiva attached to it. There were no signs of inflammation whatever.

Considering the age of the patient and the rapid growth of the tumor, I believed it might be a glioma or sarcoma, at any rate malign, and so I removed as much of it as I could get at, the same day (about 12 x 10 and 1 mm. in thickness). The tumor was exceedingly hard and attached so firmly to the sclera that there was no line of division discernable between the two. It was located to the inner side of the inferior rectus, but extended backward I do not know how far. (I simply cut off as much as I could, without any tenotomy, since I had no assistance and could not postpone the operation.) The tumor did not seem to involve the tendon at all.

Professor Benda (Krankenhaus Moabit) examined the specimen and wrote that it was a typical fibroma, not malign, but signs of inflammation.

When I told the mother the result of the microscopical examination she refused to have her daughter operated on again. In the meanwhile the patient came to me twice. The diplopia disappeared soon after the operation, but now, 1½ years afterwards, the right eye is still 1 mm. lower than the other. The tumor does not seem to have grown again.

# A CASE OF MEMBRANOUS CONJUNCTIVITIS WITH SYSTEMIC COMPLICATIONS.*

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The descriptive adjective "membranous" applied to any form of conjunctivitis is not accurate. According to the classification of the older writers membranous conjunctivitis signified those forms due to diphtheria or croup and the use of the term indefinitely permitted of the inference that the conjunctivitis was the ocular sign of systemic diphtheria or croup. More recently, the formation of a membrane during an attack of of conjunctivitis has come to mean intensity rather than kind of inflammation and any inflammation, whatever may be its origin, that reaches a high grade will be attended with membranous formation usually found on the palpebral surface of the upper lid. The density and thickness of the membrane and the depth of its invasion into the mucous membrane are modified both by the degree of the inflammatory process and the cause underlying it. The membrane of diphtheritic conjunctivitis is tougher, denser and more closely interwoven with the epithelium and basement membrane of the conjunctiva than that of epidemic conjunctivitis, gonorrhoeal conjunctivitis or the membrane-like tissue formed after cauterization by strong solutions of silver, although, as Fuchs says, in the last American edition of his text book, by Duane, deeply situated fibrous membranes are at times found in the latter forms of inflammation and superficial exudation which becomes membranous may be found in conjunction with the Loeffler bacillus.

The case about to be described presents some unusual features. It was that of a woman, 27 years of age, recently married and two months pregnant, who was admitted to the Eye Ward of the Philadelphia Hospital May 9, 1908, under the Chief Filing Diagnosis "Membranous Conjunctivitis, Gangrenous Stomatitis, Gonorrhoeal Vaginitis," and I might add that she was treated with diphtheria antitoxin.

Inflammation of both eyes commenced 7 days before admission and at the time of my first examination on May 4 there was moderately profuse purulent discharge from both eyes, pronounced edema of the lids and chemosis and in the right eye a membrane had formed extending from the upper to the lower lid, firmly attached to both and totally excluding the cornea from view. In the left eye the conjunctiva of the upper lid was partly covered by a small loosely attached membrane. Upon superficial inspection one could easily be deceived into believing that the right eye had been enucleated and that both the membrane and the purulent discharge were due to disease of the mucous lining of the soft contents of the orbit. In two days the membrane had cleared from the cornea, sclera and lower lid and became limited to the palpebral surface of the upper lid. At this time it was noted that the lower quadrant of the cornea was superficially ulcerated. Under the usual local treatment for gonorrheal conjunctivitis both eyes ultimately recovered. Frequent bacteriologic examinations were made and gonoccocci were demonstrable for several days.

No reliable history could be obtained as to the time of the beginning of the gonorrheal vaginitis. The discharge was profuse at the time of admission to the Hospital and the disease may have been present for several days. The gonoccocci disappeared from the discharge after a week's treatment.

A remarkable complication—if such it might be considered—was gangrenous stomatitis. The patient stated that 3 days before admission the tongue and lips became swollen and painful and grew rapidly worse. Swallowing of solid food was impossible and of liquids nearly so. The tongue was at least 3 times its normal size, almost perfectly black and covered with bluish black, with here and there patches of necrosed tissue. The teeth were loose and the breath exceedingly offensive. Bacteriologic examination showed numerous bacteria and cocci, including the pseudo diphtheric. Gonococci and Vincent's Bacteria—characteristic of Vincent's angina—were not found. Under treatment the swelling and discoloration rapidly subsided and in a week the mouth was well.

The ocular treatment consisted in irrigation by potas. permang. 1-2500 solution every hour, cold compresses, 10 minutes in every hour for the first two days; argyrol 25% immersion frequently; Arg. Nit. gr.2 to the oz. once daily; atropia sulph. once daily.

For the mouth: A wash of hydrogen peroxid and listerin, equal parts in glycerin and water every two hours; copper sulph. gr. 5 to the oz. applied to the gums t. i. d.

For the vaginitis: Lafayette mixture internally; potas. permang. 1-5000 locally.

Systemic: Tonics and stimulants. On May 11, two days after admission, 2100 units of diphtheria antitoxin. Dr. Poland, the Resident Physician, made the following note on May

12: "Patient states that she feels better, some improvement in left, none in right eye; the membrane in latter could not be detached." May 13, 3500 units injected. On the same day improvement was noted, the bluish discoloration of the cheeks had disappeared and the patient was more comfortable. May 15, 2100 units injected; 15th, sloughing tissue of mouth easily removed, leaving bleeding surface; general condition decidedly improved. 16th. 3,100 units. 17th. gastric disturbance, probably due to having swallowed some of the epithelial masses of the mucous membrane of the mouth. 18th, 2100 units. 19th, same. 20th, practically well. Discharged June 2.

The employment of diphtheria antitoxin was suggested by the membranous formations in the mouth and eyes, and not by the opinion that the disease was true diphtheria. The temperature never exceeded 99 1-5° and at one time fell as low as 96 4-5°. The pulse varied between 72 and 88 and the respiration between 20 and 25 per minute—not in the least indicative of an acute febrile process. The first injection was experimental. Its effect was closely watched and finding towards the close of the same day improvement in the condition of the mouth and eyes the injections were continued as recorded. Whether they were beneficial must remain uncertain, but the rapid disappearance of the ocular membranes and the casting off of the necrosed masses from the buccal mucous membrane after their inception would point to their favorable action.

# TREATMENT OF CORNEAL ULCERS.

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Though the treatment of corneal ulcer appears to be well understood and fairly uniform, it is a disease for which each surgeon seems to have a particular choice for a particular remedy and but comparatively few use the same special remedy. In a brief review of the journal articles at hand written within the last two years, I note some fifty-five different remedies championed; to this list might be easily added as many more if the text books were consulted. I do not attempt to condemn or even criticise the use of any of these, for in desperate cases we find ourselves ready to resort even to all of them, yet we must admit the diseases with the hundred remedies are not among those that are being the most scientifically treated.

Though the scientific methods of treatment already in use and the more accurate ones which surely must soon follow the careful bacteriological investigations now being made, may soon replace all our present orthodox remedies, this paper will deal only with the practical results obtained in my own practice.

A brief reference will be made to recall the structure of the cornea, quoting from Parson's Pathology of the Eye. The first layer is stratified epithelium, continuous with the conjunctiva: this has lymph spaces. The second layer, substantia propria of which Bowman's is the anterior layer, is continuous with the sclera. Bowman's layer consists of fine connective tissue fibers with no corneal corpuscles, while the remainder of the second layer consists of about sixty cross layers of connective tissue at right angles, containing corneal corpuscles surrounded by lymph spaces and a few wandering cells. The third is Descemet's homogeneous elastic lamina, the product of the single layer of endothelial cells on its posterior surface: these are continuous with those of the iris. The epithelium layer will regenerate if destroyed, the others do not; exposing the middle layer allows it to swell up and germs penetrate the connective tissue. Descemet's membrane limits the penetration of germs, though toxins and drugs may pass through it; while it remains intact, the anterior chamber remains sterile. Increased pressure retards corneal circulation and nutrition. These few facts must be ever borne in mind as on principles to be evolved from them depends the final issues in all the serious cases.

The simpler ulcers or abrasians most frequently recover perfectly without treatment; when small, clean and not irritated, simple protection or a mild solution, as boric acid or mild antiseptic ointment if indicated is ample. In my opinion any ulcer beyond this grade may be dangerous and should always be considered as such, unless bacteriological investigations prove the negative.

If the ulcer, no matter how small, shows a whitened or diseased area immediately around it which is not easily washed off, or if it is painful out of proportion to its appearance or time of occurrence, and in all grades from this on without having definite knowledge as to its simplicity—if it does not at once react to the above mild cleansing treatment—we are justified in at once taking the most efficient, safe method of checking it. The exceptions are those doubtful ones directly in front of the pupil that can be constantly watched the first two or three days.

The one and only remedy on which practically all agree is cauterization in some form. The final remedy, other than incisions, on which all agree is actual cautery in some form. Here at last we meet on common ground. In a paper on "Electro-Cautery Treatment of Corneal Ulcers" read before the American Academy of Ophthalmology and Oto-Larynology in 1903, I asked the question, "If these obstinate ulcers heal so nicely after using electro-cautery as a last resort, why not use it at first?" At that time I reported results of three years' constant use of it in all cases as above described; an additional five years with some several hundreds of additional cases only further confirm those results. After careful observation I believe the lack of its use to be due to a lack of a proper technic and proper instruments. The probe and a spirit lamp will do, but it is hard to regulate the temperature by the time you touch it to the proper spot on a moving eye; the Wordsworth-Todd cautery may remedy this. I use anything, but by preference the electro-cautery. The new little transformer of the Electro Surgical Instrument Co. is a convenient portable instrument where the alternating current is in use, especially as a lamp may be used at the same time. The regular cautery handle is preferable to the smaller ones as the smaller ones are out of order too often when required. A very short electrode in the handle at an angle, with a very small pointed platinum wire is necessary. Nearly all on the market have too large a point, but this is easily ground down. Those with flat or spiral tips carry too great a quantity of heat, or cover too large an area for fine work.

For the simplest ulcers e. g. from a finger scratch, phlyctenular, or a spot from which foreign body has been removed which remains irritated, the cautery is to be used at a black heat just approaching red. This can be determined in a light room by its burning cleanly through a piece of dry cotton. The eye previously anesthetized with holocain, cocain necessary if near the conjunctival edge, holding the lids apart with the left hand, patient directed to watch some object with the other eye, the cautery held as you would a knife under similar conditions, electrode is brought to proper temperature, previously ascertained, then very quickly the spot is merely touched—that's all. Eye bandaged, a little ointment of cocain and dionin to relieve pain for first few hours, and in a great majority of cases, except to observe results, the treatment is practically completed.

If the ulcer is larger but not deep, other conditions the same as above, the edge only is touched at intervals of about 1 mm. apart, using same precautions and keeping exactly on the edge between healthy and diseased tissue.

If the ulcer is deeper, of a more diseased appearance or spreading, then the cautery should be used at a little better than a dull red heat. In these cases any dirty spots in the bottom must also be touched, but for this the temperature must be reduced as used in the previous cases, and touched very lightly with a rapid sweeping motion.

In the very bad cases with deep ulceration and progressive destruction, fortunately in the earlier stages these usually progress faster toward the periphery than the center, therefore the portion toward the center is to be touched on the exact edge with great exactness and not as close together, but the portion most spreading may be touched farther into the apparently normal cornea and the spots made quite close together. It should be remembered that the germs penetrate in the substantia propria, and progress outward in a wedge shape so that the deeper diseased apex is covered by healthy epithelium. However, it is better to repeat the operation in a day or so if required than go too far or too deep into healthy tissue. As there is an active change taking place in the deeper layers and at the best opacity is inevitable, cauterize the entire bottom as described above.

As to the difficulty: Practice and confidence will soon overcome all. Practise with the cautery on tissue paper and temperature. Familiarity with it inspires confidence in yourself, and with perfect appliance this is more easily done than using acids, etc., the effect is more certain, the pain much less and of much shorter duration, it nearly always at once controls that intense suffering and if done as above described is absolutely safe with no unnecessary destruction of tissue. In all deep ulcers, warn every patient at the first visit of the scar which will invariably follow any treatment, and a record with diagram of ulcer is often of inestimable value. Every ulcer would do better if patient were in bed; in all serious cases this is essential. Better refuse to treat these than try it if patient will not go to bed. If ulcer spreads, cauterize spreading edge soon as recognized—don't wait, and do it as often as recognized.

General treatment when indicated is essential. Salicylate of soda or aspirin, usually at once, is of the greatest value where the inflammation is intense and pressure increased; atropin as indicated, eserin with me has been useless as a rule, cathartics always indicated. If hypopion and high tension is not relieved by going to bed, salicylates, cathartics, hypodermic of pilocarpin and local heat, or if perforation or necrosis is indicated, freely open at lower portion of anterior chamber. Remember, with Descemet's membrane intact the inside is sterile; consider well the consequences of opening; on the other hand, don't forget the effect of increased pressure on a weakened membrane and the danger of its cutting off nutrition from tissue that at this time so badly requires it. The horsehair drain I have never used, but appreciate its value in exceptional cases. Saemisch's Section I have never required. According to Dr. McClintock's demonstrations, a 1-5000 alkaline mercuric iodid solution has at least the germicidal effect of 1-1000 mercuric chlorid and several decided advantages over it. This solution is conveniently made from McClintock's Germicidal Discs and but slightly irritating and is very efficient. I am at present experimenting with different strength ointments of this, which as a dressing has advantages. Outside of rest and cleansing solutions as the mercuric iodid or zinc sulphate in boric acid, mild stimulating ointment as iodosyl, zeroform or similar preparations has a beneficial effect. In some cases argyrol solution acts nicely. Holocain, if properly dispensed, is preferable as a sedative. In regard to cocain, though it has an injurious effect, for temporary use to relieve the severe pain at first it combined with dionin in an ointment is very beneficial. It is seldom required beyond the first day in cases treated as above. Prolonged pain indicates progress of the disease; examine very carefully and recauterize if not controlled.

Of all the chemical cauterizing agents, and I have faithfully used nearly all, none has been as all round satisfactory in any case in my hands as the electro-cautery. I fully appreciate the remarks of my friend, Dr. C. Schulin, in a recent letter, referring to his paper "Constitutional Aspect of Sympathetic Ophthalmia," that the reason I do not see sympathetic ophthalmia is because I deal with a healthy, well fed people. This same comment does apply to results in corneal ulcers, yet the worst case in my own experience, in which I was in complete charge from the first, was in a robust miner in apparently perfect health. This was the only case requiring the cautery to be used five times; three times has been the limit in the others and but very few required that.

That there are serious objections to the cautery and that it may do serious damage and is very unsafe in careless hands, I am fully convinced, but I am as equally convinced that there is no single remedy known to-day that will in all cases in which active treatment is indicated, give equally good results.

# A CASE OF AMAUROTIC FAMILY IDIOCY.

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KANSAS CITY, MO.

(Professors of Ophthalmology and Otology in the Kansas City Post Graduate School and Hospital.)

History. Samuel B., age 21 months. Parents, Russian Jews; in this country only a few years. First seen about the first week in March, 1908.

The birth, as far as can be ascertained from the mother, was normal and the child was apparently normal until the third month. At about the fourth month the mother noticed that there was a change in the actions of the infant; it no longer reached for objects, etc. The infant had convulsive attacks from the 12th to the 15th month, the seizures being quite severe at time with opisthotonos. No history of syphilis can be obtained from either parent, nor is there any blood relationship between the parents.

Present State. The child is quite blind, the eyes divergent. Pupils small and do not react to light, or at least very sluggishly. The head rolls about and cannot be held erect; cannot walk, talk nor sit up.

The body is well nourished. The muscles are flaccid, the neck muscles are especially weak and have been so from the first. The cranial measurements are below the normal average, the circumference being 42 cm., the average for a child of this age being 48 cm., as given by various authors. Ophthalmoscopic examination shows an atrophic nerve head with excavation atrophy in both eyes. The chorioidal ring is well marked. The retinal vessels small and few in number.

At the macula the characteristic changes are absent, there being no central cherry red spot with a white area around it.

The patellar reflex is well marked, slightly exaggerated. Babinsky reflex negative, Oppenheim reflex positive, Gordon's paradoxical reflex positive. Sign of Fam positive.

Koller (N. Y. Medical Record, 1896) reports a case in which the changes at the macula lutea were not present at first but appeared later.

Higier (Zeitschrift für Nervenheilkunde, 1897 Band X) also reports a case in which the optic nerve atrophy was more pronounced than the macular changes.

These cases are quoted by Sachs, in Posey and Spiller, "The Eye and the Nervous System."

The absence of the macular changes in this case makes the case somewhat unusual and analagous to the cases of Koller and Higier.

The fact that there is no other child of the family with the disease is also somewhat unusual, but the parents are still quite young, there being but one more child older besides our patient and quite normal. But it is also well known that several children in the same families with cases of Amaurotic Family Idiocy escape the disease.

The first case of this disease was published by Warren Tay in 1881. It was a child a year old. Later Magnus, Goldzieher, Wadsworth, Hirschberg and H. Knapp reported cases but Sachs of New York states that "without any knowledge of the cases described by the oculists, I published the history and post mortem record of a peculiar form of idiocy associated with blindness."

And the title of the disease was correctly given by Sachs, who in 1896 had observed eight cases and gave a list of eleven others. "In 1901 Falkenstein analyzed 64 cases and since that time others have been reported." (Sachs.)

Sachs sums up the chief symptoms as follows:

"1. Mental impairment observed during the first month of life and leading to absolute idiocy.

2. Paresis or paralysis of the greater part of the body and this paralysis may be either flaccid or spastic.

3. The reflexes may be normal, deficient or increased.

4. A diminution of vision terminating in absolute blindness. (The cherry red spot in the region of the macula lutea and later optic nerve atrophy.)

5. Marasmus and a fatal termination, as a rule before the age of two years.

6. The occurrence of the affection in several members of the same family.

The etiology of the disease is unknown. The cases so far reported have all belonged to the Jewish race.

As to the pathological anatomy, Sachs states that in his first cases "the outer surface of the brain exhibited abnormalities which we were accustomed to associate with brains of inferior development. There was a confluence of the central and Sylvian fissures and a complete exposure of the island of Reil. There was unusual hardening, the knife grating on removing a small section of the cortex. On microscopical examination the most important changes were found in the cortex and sections were taken from the frontal lobes, motor areas and from the base of the 3rd convolution, from the first temporal and from the apex. The same changes were found practically throughout the cortex. It was possible to make out the various layers of cells, but an examination and a most careful search on removal of the section showed that there were scarcely half a dozen pyramidal cells which presented anything like their normal appearance."

In our case as in the others cases, treatment has not been of any benefit.

# PRACTICAL RELATION BETWEEN REFRACTION ACCOMMODATION, AGE AND OCCUPATION.

(Illustrated.)

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The criticism that a great part of the prescribing of lenses is done at haphazard, with little regard for the occupation, range of accommodation, etc., of the patient, is certainly just. For instance we are sometimes in doubt whether glasses should be given for near, and if so, as to how long they should be worn. Repeated warnings have been given,—and they should not have been necessary,—that the patient's occupation and general health should be considered, and the range of accomodation carefully measured in all cases. Instead, we too often hurry, and thus lose in time, leaving the patient unrelieved. *Festina lente* should be our motto. For example: A young patient is found to have not only a subnormal range of accommodation, but also a subnormal range of convergence. This complex invariably indicates an atonic state of the whole muscular system which some of us label "neurasthenia." Clearly it is possible, if this patient has only moderate hyperopia and no astigmatism over 0.25D., that he can put aside the glasses at some future time. When? Can we tell? Yes ,for this will obviously be as long as the ranges of accomodation and convergence are too small to meet the requirements of work at a given distance. Physiologically only two-thirds of the accommodative range can be found used with comfort, i. e., one-third must be kept in reserve, and two-thirds of the range of convergence must be kept in reserve. In other words, the punctum prox. of accommodation, (working at a distance of 3 D.,) must be at least 4.50D. in persons under 40 years of age, and that of convergence always 9.5 metre-angles, which means a near point of convergence of 10.5 centimetres, or 4.1 inches.

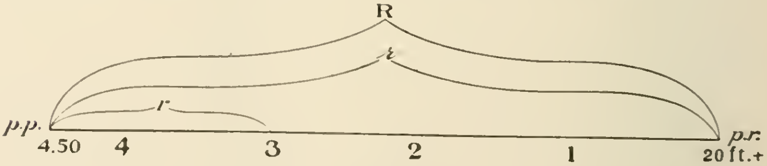

*Fig. 1.*
*(Emmetropia)*

Fig. 1.

Let us assume them in the diagram (Fig. 1.), that R, represents the *total range* of accommodation from *p. r.* to *p. p.*

r, the *manifest range,*

. . *r,* the *reserve range,* and

d, the *distance* of reading or work.

In Emmetropia R equals r; that is the punctum prox. of accommodation in dioptres represents both the total and manifest ranges of this function, since they are identical.

It follows, therefore, that in *emmetropia* we have the following values:

$R = r$; also $3\,r$.

$r = R$; also $3\,r$.

$r = \frac{R}{3}$ ; also $\genfrac{}{}{0pt}{}{r}{3}$

$d = 3$ D, (or 2 D, or 4 D) i. e., 13, 20, or 10 inches.

$L =$ a convex lens, and represents a deficiency in any part of the range of accommodation.

Several self-evident relations exist between the values above given. Thus, when the distance of work or reading is 3 D., (13 inches), the amount of accommodation in reserve must never fall below 1.50 D. in *young* persons, since this is ⅓ of 4.50 D., the lowest range tolerated.

It is also self-evident that the amount of hyperopia tolerated for near can never exceed the required reserve, *i. e.*, exceed 1/3 of the total range. We, therefore, have the following relations in emmetropia:

$R = r$; also $3r$.

$r = \frac{R}{3}$ ; also $\frac{d}{2}$

$d = \frac{R}{r}$; also $2r$.

$L = d - R + \genfrac{}{}{0pt}{}{R}{3}$ ; also $d - R + r$.

All the daily problems in emmetropia are contained in the above equations, supposing, of course, that astigmatism is corrected.

For instance: A patient in good health, aged 50, has a punct. prox. of 2D. (20 inches), and normal convergence. Hence he is presbyopic for work at 13 inches. What lens is required?

Obviously he is deficient 1D. in actual range, and requires in addition 1/3 of 2D., or 1 + 0.66, which is practically a + 1.75 sph. lens.

Employing the last of the above equations and filling in the values: $\mathrm{L} = 3 - 2 + \frac{2}{3} = 1.66$. R, at 50 years, being 2D.)

If we wish to find at what distance a person aged 40 (normal range is 4.50) can read comfortably without glasses, we use the equation giving the value of d, and write simply:

$\mathrm{d} = \mathrm{R} - r$.

Since $r$ is 1/3 of R, this means that the distance is the difference between 4.50 and 1.50, which gives us 3D. (13 inches). At a distance of 2D. (20 inches), the reserve need only be d ÷ 2 or 1D. ($\mathrm{r} = \frac{\mathrm{d}}{2}$ as above).

In *hyperopia* (Fig. 2), we have the total range R, equal to the manifest range r, plus the hyperopia; (r + h) = R.

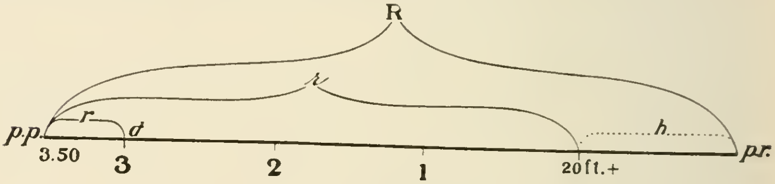

*Fig. 2.*
*·(Hyperopia)*

Fig. 2.

Therefore the values in hyperopia are:

$\mathrm{R} = \mathrm{r} \times \mathrm{h}$; also $3r$; also $\mathrm{D} + r$.

$\mathrm{r} = \mathrm{R} - \mathrm{h}$; also $3r - \mathrm{h}$.

$r = \frac{\mathrm{r} \div \mathrm{h}}{3}$; also $\frac{\mathrm{R}}{3}$

$\mathrm{h} = \mathrm{R} - \mathrm{r}$; also $3r - \mathrm{r}$.

As the distance of work and reading is generally 3D., it is convenient to fill in some of these values:

$\mathrm{R} = 3 + r$.

$\mathrm{r} = 3 + r - \mathrm{h}$.

$r = \mathrm{R} - 3$.

$\mathrm{h} = \mathrm{r} - r + 3$.

A very useful formula of frequent use is: $\mathrm{L} = \frac{3\mathrm{d} - 2\mathrm{r}}{3}$,

where L is a lens sought for.

I have found all of these formulæ of practical daily value. For example: Suppose a healthy patient whose refraction has not been measured and whose age is not known, has a puncture prox. of 3.50 D. (11.25 inches). This manifest condition, for which I propose the name of *manifest range* of accommodation, is not to be confused with the *total* range, for the latter includes *all* of the hyperopia (See Fig 2), while the manifest range includes generally only a part, and only sometimes all o fthe hyperopia.

Has this patient probably hyperopia, or is he presbyopic? Or, is there weakness of accommodation?

But we have assumed good health, so that either there is hyperopia or presbyopia, or both. According to Fig. 2, $r = \mathrm{r} - \mathrm{d}$; that is, the reserve range equals r — 3, hence this patient's reserve range is 3.50 — 3, or 0.50D. This is an absurdity; for if it were true, the total range would be (since $\mathrm{R} = 3r$) 1.50D., or less than the manifest range.

Is it the distal instead of the proximal end of the range that is restricted? In other words, is there hyperopia? If so, the amount would be equal to the total range R, less the manifest range r or (R — r). But we do not know what the patient's total range is.

However, we can find it thus: We see by Fig. 2 that the distance (*d*) of the work is always equal to the manifest range (r), less the reserve range ($r$); that is, $\mathrm{d} = \mathrm{r} - r$. It is also equal to 2/3 of the total range: that is, $\mathrm{d} = \frac{2 \times \mathrm{R}}{3}$, *i. e.*, $\frac{2\mathrm{R}}{3}$. Things which are equal to the same thing are equal to each other; therefore, in our example, since $\mathrm{r} - r = 3$ (d = 3):

$$\frac{2\mathrm{R}}{3} = 3.$$

$$2\mathrm{R} = 9.$$

$$\mathrm{R} = 4.50.$$

Hence, since the manifest range is 3.50, and the hyperopia equals R — r, 4.50 — 3.50 = 1, and this is the amount of hyperopia: 1D.

In uncorrected *myopia* the total and manifest ranges are identical, just as in emmetropia, but the punctum remotum coincides with the distal end of the range, and the reserve range often equals the total range. (See Fig. 3.)

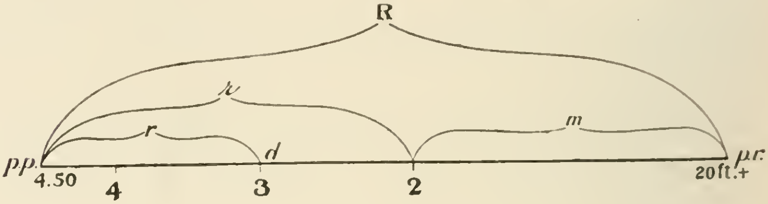

*Fig. 3.*
*(Myopia)*

Fig. 3.

A person who is myopic 2D., and has a total range of 4.50D., has necessarily, if in health, a punctum prox. of 6.50D., and a reserve range (if he works at 3D.) of 3.50D. ( See Fib. 4, b.), a reserve almost as great as the total range of an emmetrope of the same age.

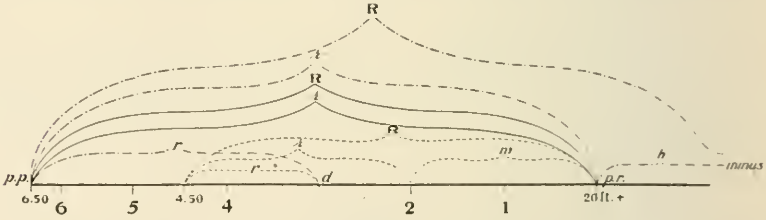

*Fig. 4.*

Fig. 4.

The blue lines represent the range, etc., of a hyperope: the red of a myope, and the black, of an emmetrope. The reserve range r, is seen to be the same in emmetropia and corrected hyperopic.

Fig. 4 represents the relations of the three dioptric conditions. The punctum. prox. is represented as being 6.50D., which, according to Duane,[*] is the normal for the age of 33 years.[†]. The far point for emmetropia and hyperopia is represented by infinity. That of myopia (of 2D.) by D. The figures below represent dioptres.

We see that in myopia the amplitude of accommodation is shifted toward the patient, *i. e.*, cut off for distance and added to for near. Examination of the diagram will also show that (giving the myope his — 2D. correction), *the total range is the same for all three conditions of refraction.* The differences are in the amounts of manifest and reserve ranges in uncorrected hyperopia and myopia. For it will be noticed that while the reserve range in both emmetropia and hyperopia is 3D., in the myope it is 3.50D (6.50 — 3D., the distance d, of work). Again, a concave lens of 2D. would make the red (myopic) diagram exactly like the black (emmetropic) one; while a convex lens would do the same for the blue (hyperopic) one. One point alone emmetrope, myope and hyperope have in common, *i. e.,* the distance (d) of work.

The equations expressing the relations in myopia then are (m representing myopia):

$R = 3r.$

$r = \frac{R.}{3}$

$\mathrm{r} = R - \mathrm{m}.$

$\mathrm{r} = \frac{r - 3\mathrm{d}}{3}$

$\mathrm{m} = \frac{3\mathrm{d} - 2\mathrm{r}.}{3}$

$\mathrm{m} = R - \mathrm{r}.$

Also:

$R = \mathrm{r} + \mathrm{m}.$

$\mathrm{r} = 3\mathrm{d}.$

$\mathrm{d} = \frac{3\mathrm{m} + 2.}{3}$

$\mathrm{d} + r = R - \mathrm{m}.$

To illustrate the use of these equations, suppose we are consulted by a healthy myope of 50 years of age who wears for distance a pair of — 2.50 spheres, and who complains of asthenopic symptoms. Since the normal amplitude of accommodation at that age is 2D., should we find this patient's near point of accommodation to be but 1.50D., we suspect that the — 2.50 spheres over-correct the myopia. We are more certain when, referring to the above values, we find: $R = \mathrm{r} + \mathrm{m}$; that is, the total range equals the manifest range plus the myopia. Now, the near point equals the manifest range. Filling in this equation with the known values of our patient:

$R = 1.50 + 2.50.$

which equals 4.D., an evident absurdity, since no one at fifty years of age has any such range. The inference is that some ciliary spasm produces a pseudo myopia.

A typical example is the following, picked at random from my card index:

Miss A. I. C., aet. 45. School teacher. Complains of impaired vision and pain, Jan. 31, 1907. Is wearing the following bifocals given by an optician two weeks ago:

With her glasses O.D.v6/5 ? accepts + 0.37s. O.S.v6/5 ?? accepts + 0.37s. With her reading segments:

Distance: Exophoria; then esophoria of 1°.

Near: Exophoria $1\frac{1}{2}$°.

At her age (45) the normal total range is 3.50.D. But as I found in O.D. a manifest range of 5D., this was enough to prove that either the lens was wrong, or the eye in a condition of ciliary spasm, or both. In spite of her age, therefore, I instilled hyoscine hydrobrom ¼ per cent., and in 16 hours I found: O.D.V with — 5.50s = 6/5; O.S.V. with — 4.75s 6/5. That is, in each eye the myopia had been over-corrected, and a pseudo astigmatism corrected. Nine days later, with the — 5.50s. the near point of accommodation in the right eye was only 2.75D., instead of 5.D. with a — 6.50s as before: showing that the apparently strong accommodation was the result of ciliary spasm, which we know is a sign of weakness.

What is the correct reading lens for this patient? According to our working equation,

$$L = \frac{3d - 2r}{3} \text{ (d equaling 3D.)}$$

As after resting, in O.D., r = 2.75; therefore:

$$L = \frac{9 - 2 \times 2.75}{3} = 1.50.$$

Her reading lens for 3D. (13 inches) distance is, therefore, a + 1.50 sph taken from her distance lens (— 5.50), which gives a — 4.00 concave lens.

In conclusion, I desire to state that the relations indicated in the several diagrams and in the equations represent true *physiological* values and relations, and have a real practical value; provided, always that the general health is duly considered and astigmatism corrected. They serve, moreover, to very often indicate when or not a cycloplegic must be used. Lastly, they truthfully indicate the relations existing between emmetropia, hyperopia and myopia, essentially correlated as they are.

212 Medical Building.

# THE DEPENDENCE OF OPHTHALMOLOGY UPON OTHER BRANCHES OF MEDICINE.

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Students of the literature of the past decade can hardly have failed to discern the development of a new tendency in ophthalmic thought—tendency which has sought to correlate the truths of ophthalmology with those of its sister branches of medicine. From the middle of the last century, when the ophthalmoscope marked the birth of modern scientific ophthalmology, our specialty has tended toward a curious isolation. Instead of fitting snugly into the great mosaic of the medical branches contiguous to neurology, internal medicine, rhinology, etc., it has shown an unfortunate exclusiveness, occupying a little space apart. Doubtless, the essential difference between certain of the problems of ophthalmology and those of other branches of medicine was the main factor in the development of this tendency. Ophthalmic practitioners encountered so much that seemed satisfactorily explainable on a purely ophthalmic basis that they forgot, or perhaps never realized, the often scarce tangible, but none the less real, dependence of ocular defects upon abnormal conditions in various parts of the organism. Many came to regard an eye much as dentists regard a tooth—as being in the body, but not an integral part thereof.

It would be a matter of supererogation to dwell upon the error of this attitude, leading, as it did, to the loss of all sense of proportion and perspective. He who has no sense of perspective is incapable of maintaining that openness of mind and freedom from prejudice indispensable to a scientific worker.

Can we have a comprehensive understanding of the clinical and pathological aspects of ocular tuberculosis if we ignore the clinical and pathological aspects of tuberculosis in general? Do we so thoroughly understand the train of events leading to the establishment of a glaucomatous state that we can dispense

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Read by invitation before the Chicago Ophthalmological Society, October 12, 1908.

*Read November 16, 1908, N. Y. Academy of Medicine, Section on Ophthalmology.

with a knowledge of any morbid activity of the general bodily functions? Is the pathogenesis of cataract a problem that can be approached without a knowledge of the processes of general metabolism?

With the passing of that phase of ophthalmic thought which regarded the eye as an isolated instrument apart from the general bodily organism, there was ushered in a period hardly less ridiculous, when viewed in the list of present ophthalmic concepts. I refer to that point of view which, while recognizing the eye as an integral part of the body, placed upon it the responsibility of originating a countless number of reflex disturbances in remote organs. I would not for a moment detract from the high scientific value of the work of Weir Mitchell, Thomson, Norris, Green and others, who for the first time pointed out the indubitable relation between ametropia and muscular imbalance, on the one hand, and headaches of various types, reflex nausea and vomiting, vertigo and certain other fairly well-defined physical ills, on the other. The soundness of the views enunciated by these pioneers has been abundantly verified by experience. It is not with these that we would take issue, but rather with certain of their followers, who, working along the same general lines, developed a creed seriously at variance with the original teachings. These zealots, thunderously proclaiming from the housetops, have done much to bring discredit upon the realities of eye-strain reflex by ignoring the possibility that abnormal conditions elsewhere might with greater justice be held responsible for symptoms. Harkening to such as these, we would have to admit that practically all headaches of whatever character originated from ametropia and muscular imbalance; that the neurologist, the rhinologist, the gastroenterologist, the gynecologist, etc., were never to be considered as of possible assistance in the interpretation of head pains and in the determination of their origin. The problem of headache, far from being the simple one that some of our hyper-enthusiastic colleagues would have us believe, is an exceedingly complex and difficult one, and will often tax to the utmost the diagnostic resources of the neurologist, the internist, the rhinologist, etc. To the enormous credit of American ophthalmologists, it should be noted that they have withstood the hurricane of verbosity that has swept the land and, not having reached similar conclusions after years of painstaking practice, have assumed the Missouri attitude and demanded "to be shown."

Signs are not wanting that this phase is passing, nay, is already in the past, and that the ophthalmic conscience has awakened to a realization of the necessity for a broader view,—a more extended scope. Ophthalmic practitioners are daily realizing that only with the collaboration of their colleagues in other branches of medicine can they hope to attack fundamentally many of the problems of ophthalmic diagnosis, prognosis and treatment.

The relation between various ophthalmic disorders and general dyscrasiæ has always been recognized. Thus certain types of retinitis were found to bear a definite relation to Bright's disease and diabetes; certain types of iritis and keratitis to syphilis or malaria. Diagnosis in such cases was often ventured upon with painstaking regard for all the local evidences of the disease in question, but with a total disregard, beyond a perfunctory and often incomplete urinalysis, of the general bodily condition. Doubtless in the great majority of such cases the ophthalmic evidence was sufficient to establish an exact diagnosis, leading to the exhibition of appropriate constitutional treatment. But, unquestionably, there remained a minority in which the ophthalmic signs alone were insufficient for a differential diagnosis, and among such cases, empirically managed on insufficient etiological data, are to be counted the failures of ophthalmic therapy. All the blame, however, should not be shouldered upon the ophthalmologist. Even had he had the desire for more exact knowledge of the general processes underlying the special morbid activities in the eye, it is highly questionable whether any colleague could have supplied the special information wanted. Physiological chemistry, which has illuminated so many of the dark by-ways of general medicine, is a child of only a few years' growth. To this helpmate, our elder brethren could not appeal. Nevertheless, the knowledge which might have been gained from general clinical observations was too often deemed unnecessary to the completion of the disease picture.

The importance of exploring every avenue in the search for the exact diagnosis is now generally recognized. Too long have we been content with such vague and unsatisfactory labels as rheumatic, gouty, anemic, idiopathic, etc., which we blithely affixed to every disease, the etiology of which was not perfectly obvious. Such slipshod and lazy evasions could have but a single corollary, viz., ineffective therapy. May the time shortly arrive when such terms as these will not be used to cloak our ignorance.

Accuracy in diagnosis is being attained not only by examination of the organism as a whole, but frequently by the knowledge gained from the application of the newer diagnostic tests. For example, the injection of tuberculin has enabled Verhoeff[1] to establish the tuberculous nature of anterior sclero-keratitis hitherto ascribed to rheumatism. The tuberculin reaction of Calmette, and the cutaneous tuberculin vaccination of von Pirquet, devised originally to facilitate the diagnosis of general tuberculosis, are finding an appropriate field in establishing as tubercular ocular conditions, obscure from the clinical standpoint.

Illustrative of the advantage of a close association between the ophthalmologist and the internist in the diagnosis and general management of ocular disease, permit me to cite the following cases:

Case 1.—Mrs. J. L. S. Age 35; came under observation July, 1901. Has had recurrent attacks of iritis in both eyes, associated with some vascularization of the upper portion of the left cornea. No evidence of trachoma. The present attack, largely confined to the right eye, was controlled by the usual local rmedies. There persisted, however, some ciliary redness. In the course of the past seven years I have observed her in eight attacks, which became increasingly difficult to control. My personal inquiries into her medical history did not throw much light on the case. Internal treatment was largely empirical, consisting mainly of potassium iodide and mercury. Last June the patient returned with an anterior sclerokeratitis and iritis of the left eye. She was referred to Dr. L. M. Warfield, whose examination disclosed puckered scars in the neck chararteristic of healed tuberculous suppurating glands, and the physical signs of an old healed apical tubercular lesion. V. Pirquet vaccination positive. Under graduated doses of tuberculin T. R. the corneal lesion has undergone a rapid reparative process.

Case 2.—Mrs. R. A. Age 38; has had repeated attacks of anterior sclero-keratitis. The right peripheral corneal nebulæ, the left fresh corneal infiltrations below and temporally. Physical examination disclosed an increased vocal fremitus with broncho-vesicular breathing over the right apex—evidently an arrested pulmonary tuberculosis. The diagnostic injection of tuberculin was positive. The prompt improvement in the corneal lesions following graduated doses of tuberculin was very striking.

Case 3.—Miss S. V. G. Age 17; came under observation in February, 1902. At this time there was a moderate-sized patch of retino-chorioiditis in the upper temporal fundus, with many fine shreds in the vitreous. She made an excellent recovery under small doses of corrosive sublimate. In July, this year, she returned with a fresh patch of chorioiditis contiguous to the old scar, and with membranous opacities in the vitreous. The ciliary region was congested. The pupil reacted well to light and dilated perfectly under a mydriatic. The case failed to respond to the former treatment and there appeared shortly an infiltration of the cornea in the outer upper quadrant. Physical examination by Dr. Warfield revealed nothing very definite, though he noted that the breathing was somewhat reduced on the left side. . The von Pirquet cutaneous tuberculin reaction was positive on the right arm after 24 hours, showing a pink papule .5 c.m. in diameter. The iris was carefully examined with the Zeiss corneal microscope, which revealed several very minute miliary nodules near the papillary margin. The tuberculosis nature of the chorioditis being now apparent, tuberculin injections were at once instituted. Recovery has been uninterrupted. The specific action of the agent was beautifully demonstrated by the gradual disappearance of the iritic nodules.

I may state, parenthetically, that this highly valuable therapeutic agent is a double-edged sword. Administered in too large doses, at too frequent or at too remote intervals, it is likely either to do harm or to fail to give complete satisfaction. The ophthalmologist, unless he be connected with a large ophthalmic institution, will rarely have the opportunity of acquiring the technic of its administration. I am convinced that the patient's interest will generally be best subserved by entrusting the injection to a competent internist.

Another field wherein results can only be obtained by the intimate association of the ophthalmologist and the physiological chemist is that of ocular disease due to intestinal auto-intoxication. The stduies of Elschnig[2], of Broyer[3], and de Schweinitz[4] (in collaboration with physiological chemists) indicate that further exploration in these hitherto untilled fields will yield results highly important in the diagnosis and therapy of various ophthalmic diseases. It seems reasonable to classify the following case in this category:

Case 4.—Miss A. A. Age 30; came under observation July, 1904. Glaucoma simplex, both R. V. 16/xix L. V. p. l. Typical steep glaucomatous cuppings of both disks. Right field showed a moderate inferio-nasal contraction. Inclusive miotic treatment with eserin and pilocarpin was unavailing to check the progress of the disease, vision failing to 16/xxxviii. She was now referred to Dr. Jesse Myer, whose examination revealed a congenital atonicity of the entire gastrointestinal tract resulting in an obstinate constipation dating from childhood. Under dietary and electrical treatment with abdominal massage, the constipation was greatly relieved. Although no change was made in the ocular treatment, vision rapidly rose to 16/xi and has remained at this point to the present writing (Sept. 24, 1908.) The peripheral field has remained unchanged, although within the periphery small sector defects are now found. May not the restoration of noxious material from the intestine have given rise to an optic neuritis? We have, then, only to assume the existence of an inherent weakness in the lamina cribrosa, to complete the sequence of events leading to the glaucomatous state.

Every opthalmologist will recall instances of the sudden development of asthenopia in individuals who hitherto have been able to use the eyes with perfect freedom. Examination reveals an insignificant refractive or muscular error. Appropriate glasses are prescribed which far from lessening the disability seem only to increase it. Should we, without further ado dismiss the patient to his fate? Surely not. Rather should we endeavor to determine the existence of any general morbid condition which might conceivably be, as Woods[5] has recently termed it, an "accessory factor of eye-strain." This author declares that fatigue unrelieved by lenses and often associated with so-called hystemical accommodation may be due to special susceptibility of the eye to possible irritation from such causes as syphilis, intestinal disorders, haemic and nutritive troubles and pelvic anomalies. From much the same point of view de Schweinitz[6] warns the opthalmologist to guard against error by bearing constantly in mind the "mimicries of eye-strain." any of these arise from defects of metabolism such as make the gouty diathesis. Such symptoms may depend upon a point of tenderness in the ciliary region or arise as symptoms of neurasthenia or hysteria, or from subnormal accommodative endurance due to constitutional conditions.

Examples might be indefinitely multiplied of recent papers dealing with the dependence of ophthalmic disease on internal disorders. I may allude to the discussion of the infections of the eye in gastrointestinal disorders by Casey Wood; to the studies of angio-sclerosis by Alleman, de Schweinitz, Suker, Marple, Woodruff, Lamb, Bull and others; to the relations of gout and lithemia to the eye by Bull; to the role of malaria in the etiology of chorioiditis and retinal detachment by Bull, Cosmettatos and Truc; to the role of infectious diseases in the production of optic neuritis by Bichelonne and Antonelli; to the relation between unilateral mydriasis and incipient tuberculosis of the lung by Bichelonne, etc.

## Relations with Neurology.

A discussion of the numerous points of contact between ophthalmology and neurology is outside the scope of this paper. The opportunity afforded for original investigations by the collaboration of a neurologist and ophthalmologist as shown in the work of Cushing and Bordley in Baltimore, and of de Schweinitz, Spiller, and Mills in Philadelphia, is now bearing fruit in greatly increased knowledge of certain obscure problems on the borderland of ophthalmology and neurology.

Ocular disorders in which neurologic consultation will often be advantageous and frequently indispensable include palsies of the ocular muscles, inequalities and abnormal reactions of the pupils, optic neuritis and choked disk, certain types of retrobular neuritis, defects of the visual field suggestive of chiasmal or cortical lesion, and visual anomalies of an hysterical type. In the presence of these conditions the ophthalmologist must acquire, if only for the welfare of his patient, as complete a knowledge of any underlying lesions of the nervous system as the most painstaking neurologic examination can furnish. It is hardly to our credit that we should claim to have cured by means of potassium iodid a transitory abducens palsy which in reality was an early expression of tabes dorsalis. Nor should be assume that a partial atrophy of the nerve heads will be benefited by usual therapeutic methods, until we can be sure that the ocular condition is not incident to a multiple sclerosis. In this connection a most besetting and unpardonable sin is the willingness on the part of a few of our brethren to "treat" the papillitis of intracranial neoplasm with a little corrosive sublimate and potassium iodid.

The following cases illustrate how indispensable to the oculist may be the neurologist's help.

Case 1.—W. T. R. Age 47, male; consulted me March 26, 1906. Five weeks ago, while walking down town one morning he discovered that he was seeing double. The diplopia has persisted since then. There was a well-marked palsy of the left abducens. Vision normal. Ophthalmoscope negative. Patient was at once referred to Dr. W. W. Graves for neurological examination. This revealed slight Rombergism; disturbed posture sense in toes; hypoalgesia about lower extremities and in posterior root distributing from seventh cervical to eighth dorsal nerve, inclusive; analgesia of testicles, absent triceps and achilles jerks with greatly diminished and unequal knee jerks and slight ataxia in the arms and legs. These findings, with the history of lightning pains, bladder hesitancy, diminishing potency, laryngeal crises and with positive history of syphilis rendered the diagnosis of tabes dorsalis unquestionable.

Case 2.—H. W. Age 38, studied in conjunction with Dr. Graves. This patient had unequal pupils, right measuring 4.5 mm., the left 5.5 mm. with slight bilateral ptosis. The ophthalmoscope revealed full-blown optic neuritis, the apex of the right disk 2.5 D. above the level of surrounding retina; the apex of the left disk 3. D. above level of retina. R. V. 16/xv; L. V. 16/xxiv. The right visual field was slightly, the left markedly, concentrically contracted. The history showed that for eighteen months he had been having more or less headache with frequent vertigo, occasional vomiting and feeling of weakness and numbness about right leg. Dr. Graves's examination showed the right knee jerk more active than the left, right abdominal reflexes much weaker than the left; otherwise negative findings in the nervous system. By a process of exclusion, the diagnosis of brain tumor localized in the left superior parietal region was reached. The localization was materially strengthened by finding altered percussion note (flatness) in this region. A bone-flap operation by Dr. Willard Bartlett revealed a diffuse, irremovable glioma. The operation was converted into one of decompression. Five months later his disks showed a complete reduction of the swelling but were evidently passing into partial atrophy. R. V. 16/xv. L. V. 16/xxiv. Visual fields the same as at first examination. The patient lived six months after the operation in comparative comfort, although for two months prior to death he became gradually anaesthetic, ataxic, and paretic about the right side of the body.

The following case demonstrates the necessity of care in interpreting a history of head pain:

Case 3.—F. G. Y. Age 26; consulted me Dec. 19, 1905. He stated that he had suffered from almost continual vertical headache for 8 or 9 years. On several occasions his refraction had been measured by competent oculists, but he had failed to get relief. He had also been seen by several rhinologists, one of whom wished to operate. My examination showed nothing but a very moderate hyperopia in either eye, my results exactly coinciding with the glasses which he was wearing. Patient was referred to Dr. Graves, who found that, excepting for cold and clammy hands and marked dermotographism, the physical examination was wholly negative. Psycho-analysis, based upon voluntary admissions concerning his personal history and especially his sexual history disclosed a dominant masturbational idea; i. e., he had seriously injured himself by a single act. A good friend had told him of the serious results of masturbation, and the reading of quack advertisements, marriage guides, family advisors, etc., had led him to discover a left varicocele, loss of memory, timidity and signs of insanity. The only symptom complained of was headache. An analysis of this statement disclosed the fact that he had really never had headache, but a vague feeling of fullness and pressure in his head, which he believed to be, like the symptoms which he had suppressed, due to masturbation and a certain sign of approaching insanity. The treatment consisted in the thorough dissipation of the patient's ignorance concerning sexual matters. With this accomplished his fears rapidly vanished and with them his so-called headache.

### Relations with Rhinology.

The enlargement of the ophthalmic field of vision is nowhere more strikingly illustrated than in the present universal appreciation of the fact that various functional and organic diseases of the eye and its adnexa are due to diseases of the nasal cavity and its accessory sinuses. Twenty years ago certain pioneers began to associate certain ocular disorders of obscure etiology with morbid conditions in the nose. Since then the literature of the relation of nasal to ocular disease has grown yearly by leaps and bounds, until at the present time every ophthalmic surgeon must give heed to the possibility that nasal disorder is at the bottom of many cases which consult him. To be sure, the more obvious relationships, such as existed between empyema of the sinuses and orbital abscess, between obstruction at the lower end of the nasal duct and chronic epiphora, between exophthalmus and secondary involvement of the orbit from tumors originating in the sinuses, were well known prior to the general awakening of interest in this subject. On the other hand, the less obvious relationship between nasal and sinus disorders and functional derangements of the eye were far from being understood or appreciated.

In this connection the work of Ewing and Sluder[7] should not be forgotten. These writers demonstrated that altered pressure within the frontal sinus resulting from a closure of the outlet was the basis for a train of ocular symptoms which, for want of a better term, we must call astenopic. Such patients complain of lacrimation, headache, and inability to use the eyes for more than a few minutes at a time. Not infrequently there are notable muscular errors. Correction of the refraction is never followed by complete relief and not infrequently renders the patient's sufferings more acute. If, in addition to these signs, there is found acute tenderness to pressure over the upper inner wall of the orbit just internal to the pulley of the superior oblique, it is almost certain that a blocking of the outlet of the frontal sinus will be found. Sluder, in a personal communication, informs me that the blocking occurs in various ways: (1) The tubercle of the septum may crowd the middle turbinate against the wall of the nose. (2) The middle turbinate itself may be tightly applied to the wall of the nose. (3) There may be a simple hypertrophy of the mucous membrane, or (4) an edema of the vault of the middle meatus, or (5) an impinging of the bulla against the uncinate process of the ethmoid (only revealed after removal of the anterior portion of the middle turbinate) or finally (6) chronic swelling of the mucosa subsequent to a healed empyema. Coincident with the reëstablishment of potency the ocular symptoms subside, often with miraculous suddenness, the headache vanishes, the asthenopia is relieved and not rarely the correcting lenses can be discarded.

Among authors who have been especially insistent concerning the dependence of ocular disease upon accessory sinus troubles, should be mentioned Ziem, H. M. Fish, Onodi, Patterson, Posey, Brawley and H. C. Parker summarizes the ocular symptoms dependent upon sinus disease as follows:

(1) Disturbance in vision and visual fields; (2) changes in the orbit; (3) affections of the lacrimal apparatus; (4) af-

fections of the lids; (5) affections of the intraocular muscles; (6)affections of the conjunctiva; (7) affections of the cornea; (8) pupillary changes; (9) affections of the uveal tract; (10) cataract; (11) changes in refraction; (12) headaches and neuralgia.

For purposes of clinical consideration we may divide these cases into two main classes. The first includes ocular disorders of a functional character; the second, those in which an anatomic alteration in one or more of the ocular tissues has taken place. Illustrative of the first class are the following cases:

Case 1.—Miss B. H. Age 19; complained of a tired sensation in the eyes and head. After reading half an hour the lids felt "droopy" and tended to close. The print blurred. R. H. 1.5 V. 16/xii. L. H. 1.25 V. 16/xii. Esophoria 2°. Glasses for constant wear were prescribed. She was seen from time to time and while professing herself somewhat benefited by the glasses still complained of a dull aching in the head and inability to use the eyes for more than a few minutes at a time. Finally I discovered that pressure in the orbit over the frontoethmoidal region caused great pain. On March 2, 1904, the patient was referred to Dr. W. E. Sauer, who found very large middle turbinates on both sides. On removal of the anterior half of both turbinates the headache at once improved and soon ceansed altogether. The patient was greatly gratified to find that she no longed required her glasses for constant wear, and thereafter used them only for near work. Three years later she was again seen and stated that aside from a slight headache during acute coryza she had remained entirely well.

Case 2.—J. H. B. Age 20; came under observation in December, 1901, complaining of "neuralgia" and inability to use the eyes. His refraction (a low hyperopic astigmatism) was fully corrected without material amelioration of the symptoms. The true nature of his case entirely escaped me until January, 1904, when the symptoms became much more severe, the pain being localizd over the right eye and accompanied by a profuse lacrimation. Rhinological examination by Dr. Sauer revealed an acute suppuration of the anterior ethmoidal cells. The anterior half of the middle turbinates was removed and the ethmoidal cells opened up. This was followed by a complete relief from the pain and the prompt disappearance of the asthenopia.

Illustrative of the second class, viz., those in which actual pathologic changes in the eyes are directly dependent upon intranasal and sinus disease, are the following:

Case 1.—R. S. S., teacher. Age 34; consulted me April 6,

1908. In June, 1906, he had been examined for glasses by a competent oculist and received lenses correcting a myopic astigmia. In the spring and early summer of 1907, he suffered a great deal with headache and insomnia. In February he began again to suffer with insomnia, indigestion and headache, which was mainly vertical and temporal. The head pain was always more acute on arising, and became intolerably severe whenever he lay on his right or left side. He was continually conscious of mental hebetude which, try as he would, he could not shake it off. Once, while conducting a class, things appeared "double," the diplopia, however, lasting less than an hour. With his correcting glasses vision in either eye was normal. Esophoria 5°; right hyperphoria 1.5°. On ophthalmoscopic examination I found an optic neuritis with several retinal hemorrhages near the disk in either eye. Suspecting a nasal origin for the trouble, the patient was referred to Dr. Greenfield Sluder, who reported a bilateral frontal, ethmoidal, and sphenoidal empyema, of a very acute character. Drainage of the suppurating cavities resulted in a rapid subsidence of the neuritis and the disappearance of all the head symptoms.

Case 2:—H. S. Age 8; had been having headache off and on for a year. Four days ago he complained of a more severe pain over the left eye and 24 hours later the eyelids became greatly swollen. I found him suffering from orbital cellulitis with exophthalmus down and out. In consultation with Dr. H. W. Loeb, pus was found coming from the posterior ethmoidal cells on the corresponding side. A deep incision between the internal rectus and the pulley of the superior oblique released a pocket of pus near the apex of the orbit. The patient made a slow but excellent recovery. Recently Dr. Loeb has removed a portion of his middle turbinate and opened up the ethmoidal cells.

Case 3:—Mrs. M. S.. While awaiting confinement at the Female Hospital developed fever, with pain in the left cheek and upper teeth. The left eye was congested. Th condition largely subsided and on March 19th she was delivered of a healthy child after normal confinement. The following day the left eye was again red and puffy. I was called in consultation and found a chemosis confined to the lower half of the left bulbar conjuctiva. The ophthalmoscope showed no abnormality. Vision normal; no exophthalmus. Rhinoscopic examination by Dr. R. P. Scholz revealed the septum deviated to the left. The inner half of the middle turbinate on the left side was obscured and that body pressed up to the bulla of the ethmoid thus greatly narrowing the middle meatus. An hour after shrinking the nose by cocaine and adrenalin there was a copious flow of foul smelling pus from the left middle meatus. The following day temperature had dropped to normal and a needle was passed by way of the inferior meatus into the antrum washing from that sinus a large amount of purulent material. The ocular symptoms rapidly disappeared and the patient made an uninterrupted recovery.

### Relation with Dermatology.

The literature of the past ten years contains many allusions to the more or less intimate association of skin diseases with certain disorders of the anterior ocular segment. Recently Schirmer[8], Stephenson[9] and Wicherkiewicz[10], have reported cases of acne rosacea corneæ associated with the usual facial lesions of acne rosacea. These lesions resemble those of phlyctenular ophthalmia and consist of superficial loss of epithelium and slight infiltration of the cornea. These authors emphasize the futility of local ocular treatment without attention to the facial lesions. Instances of these relationships might be multiplied by I wish especially to call attention to one which, I think, is not thoroughly appreciated by ophthalmologists. Engman, in an article on the relationship between certain catarrhs of the skin and mucous membranes of the eyes, ears, nose and throat, states that Hardaway and Wolfner carried on a series of clinical observations to demonstrate the relationship of eczematous seborrhea of the scalp and certain granular and catarrhal conditions of the lids. They concluded that there was probably an infectious relationship between the two localities in these conditions. Hardaway states that eczema tarsi is, in a great majority of cases, associated with a seborrhea of the scalp and probably owes its origin to that source. v. Michel points out the frequency with which phlyctenular conjunctivitis occurs with eczema of the face and body and he believes that there are sufficient pathological and clinical reasons to consider this type of conjunctivities a true eczema. The following cases will illustrate this close connection:

Case 1:—Miss M. G. Age 28; came under observation Jan. 7, 1907. Fifteen months ago right eye became red and watery accompanied by a foreign body sensation. Local treament had proved ineffective. The case was distinguished from a mild chronic blepharo conjunctivitis only by the presence of numerous vascular foci at the upper margin of the cornea. For four months I exhausted the ophthalmic armamentarium in a vain effort to cure the conjunctivitis. Finally I noticed a slight scaling of the skin of the right eyelid and cheek. The patient was referred to Dr. William H. Mook, who reporaed as follows:

"On the right eyelid, right ear and bboth cheeks are small erythematous sharply defined macular lesions, the surface covered with yellowish, somewhat greasy, scales. The hair and scalp are very oily and the nose, chin and forehead (the socalled seborrheic areas) are in the same condition." With the institution of appropriate treatment by Dr. Mook the eye showed immediate improvement and within four weeks was entirely well.

Case 2.—E. C. A thin, nervous young woman. Has had a chronic facial acne indurata for several years. A high grade hypermetropic astigmatism is fully corrected. She has chronically thickened and velvety palpebral conjunctivæ with con siderable scaling blepharitis. I did not at first grasp the causative connection between the acne and the conjunctival inflammation and hence failed to make much headway with usual local methods. Finally she was referred to Dr. Mook, who reported that the scalp and skin were very oily and that large and small papulo-postules in all stages of development, and large and small typical acne scars covered the face. Treatment of the skin resulted in immediate improvement in the ocular condition. She would not persist in the treatment for the seborrhea, but returns when it relapses, having learned that dermatological treatment is more successful in improving the conjunctivitis than any local application to the eyes.

### Relations with Gynecology and Obstetrics.

In searching for a possible cause for ocular diseases the oculist should ever bear in mind the possibility that pelvic disorders may furnish the clue to the problem in hand. A recent monograph of 232 pages by Berger and Loewy—"Ocular Disturbances of Gynecological Origin"—indicates the importance of this relation. The literature on the subject is ever increasing. As is well known normal menstruation may be accompanied by conjunctival congestion and purulent secretion. Unilateral blindness has been caused by retinal hemorrhages and palillitis occurring during menstruation. Double interstitial keratitis which appeared to have a very infinite relationship with amenorrhea has been observed. An interesting case (reported by De Boisinont) is that of a young girl who had an intraocular hemorrhage leading to blindness of six weeks, duration and which resorbed only on the appearance of the first menstruation. Webster, in a discussion of ocular disorders incident to pelvic troubles, reports two interesting cases. A young girl had suffered from sore eyes with occasional corneal ulcers for 8 years. The eyes were invariably worse during abdominal and pelvic pain and during menstruation. Local treatment proved entirely unavailing. Gynecological examination revealed an enlarged and retroflexed uterus and enlarged, prolapsed and cystic ovaries. Vaginal panhysterectomy was followed by complete and permanent cure of the eye trouble in ten days. In the second case the eyes discharged pus and blood escaped from the conjunctiva at times corresponding with a period when menstruation should have taken place. Unilateral öophorrectomy was of benefit, but complete cure of the eye trouble did not take place until the second ovary was removed.

The possibility that headache, apparently of ocular origin, may be due to pelvic abnormality is illustrated by the following case:

Case 1.—Miss L. B. Age 32; came under observation in July, 1900. Her complaint was mainly of constant frontal headache from which she had been suffering for the past 15 years. She was impressed with the likelihood that the eyes were at fault from the fact that the headache was always worse when she used the eyes to excess. Refraction proved to be a hypermetropic astigmatism of low grade. Esophoria 2°, no hyperphoria. Notwithstanding a full correction, she remained unimproved. On investigating her general medical history I learned that the headache was always worse during menstruation and that in addition to that she had a good deal of back ache. Gynecological examination by Dr. George Gellhorn disclosed a chronic endometritis and vaginitis. Dilatation of the cervix and intrauterine treatment with rest in bed was followed by Swedish gymnastics and iron internally. Five months later she reported that she was vastly improved, had gained considerably in weight, and that the headache had entirely disappeared.

The occurrence of optic neuritis in pregnancy is well known and frequently furnishes a proper indication for the termination of gestation. I have recently seen a patient who had had several attacks of unilateral optic neuritis coincident with her several pregnancies. From these attacks she made a perfect recovery subsequent to delivery at full term. I saw her in, I believe, the fourth attack coincident with the fourth pregnancy. The occurrence of optic neuritis during lactation has been noted by a number of authors and an excellent summary of the literature to date has been made by G. S. Derby. The following is a case in point:

Case 2.—Mrs. M. Age 30; came under observation in July, 1901. She was nursing a splendidly healthy infant of three months. Two weeks prior to my first examination she experi- a sudden dimness of vision in one eye, and within twenty-four hours was practically blind in both eyes. Examination revealed a full-blown optic neuritis in either eye. Vision was reduced to counting figures at 1 foot. Neurological examination proving absolutely negative, the patient was placed in a hospital on eliminative and alterative treatment. She recovered with a small central scotoma in the right eye; left eye, normal vision. The exclusion of constitutional or neurologic cause for the neuritis and its coincidence with active lactation warrants the assumption that the latter was the *fons et origo mali.*

## Relation with Urology.

The connection between a gonoccocal ophthalmia and a specific urethritis is too obvious to require comment. Writers have sought to establish a relationship between gonorrhœa and iritis but the relation of cause and effect is by no means entirely proved.

Metastatic gonorrhœal inflammation of the conjunctiva and occasionally also of the lacrimal glands have been recorded. Several years ago I encountered the following case:

Case 1.—A young woman was admitted to the St. Louis Female Hospital with the diagnosis of gonorrheal ophthalmia. On examination I found both conjunctiva chemotic and ill defined swellings in the upper outer portion of each orbit. These masses could be palpated and were evidently swollen lacrymal glands. There was but little discharge and that of a mucoid character. The patient had passed through an attack of gonorrhea some five months previously and subsequently arthritis involving several joints developed. Two weeks prior to admission to the hospital, she incurred a fresh attack of gonorrhea. Smears from the conjunctival sac were negative although vaginal and urethral secretion showed gonococci in abundance. The application of iced compresses sufficed to effect a cure in a week.

## Relation with Otology.

The ocular complications of otitic disease are mainly those of muscular paralysis and optic neuritis. J. and A. Terson[13] have observed total paralysis of the sixth nerve developing in the course of an acute suppurative otitis. The palsy affected the same side as the otitis and was not accompanied by either unilateral or bilateral optic neuritis.

A discussion of the intracranial complications of otitic disease which give rise to optic neuritis would be out of place in this paper. In this connection it should borne in mind that optic neuritis may occur in connection with purulent otitis media without evidence of intracranial or vascular complications. Barr and Rowan[14] found optic neuritis in 6 per cent. of such cases while in 21 per cent. there were vascular changes stopping short of neuritis. The cases which showed these ophthalmoscopic symptoms proved especially liable to do badly. They should be closely watched and the radical mastoid operation performed early. If, however, the intraocular symptoms improve the course of the case is likely to be favorable.

In passing, it may be recalled that certain types of nystagmus are of vestibular origin and hence demand otologic consultation.

## Relations with Dentistry.

The ophthalmic surgeon should not neglect to interrogate the condition of the mouth and teeth as it appears unquestioned that there exist definite causative relation between affections of the mouth and those of the eye. A series of cases of iritis reported by E. K. Campbell [15] was associated with inflammation of the alveolar margin of the teeth or pyorrhea alveolaris. Treatment directed toward securing oral asepsis combined with local treatment effected a cure. Coopman reports the following case: A healthy child of three years in whom there was no complaint connected with detention. developed a tonic blepharospasm which resisted internal and local medication. On the 5th day a slight swelling of the gum back of the second temporary molar was incised, revealing the points of a precocious molar. The blepharospasm became at once intermittent and in one day had entirely ceased. Harmon[17] writes of chronic iridocyclitis associated with sepsis arising from the buccal cavity. The whole question has recently been interestingly discussed by Allport[18] who cites cases of iritis, sclerokeratitis, herpetic eruptions of the cornea, diminished or suspended accommodation, optic atropy, etc., following inflammation around the teeth.

The foregoing fragmentary consideration of some of the innumerable points of contact between ophthalmology and her sister branches of medicine may serve to emphasize one all-important verity, viz., the imperative necessity of an unrestricted view of the entire medical horizon on the part of the ophthalmologist. If we are to lift ourselves from the rut of mere specialists to the plane of wise physicians, it is incumbent upon us never to rest content with the contemplation of our daily work from the ophthalmological aspect alone. We must approach each case with a mind open to all its inherent possibilities. It has been charged, and not altogether unjustly, that our absorption in the special problems of ophthalmology has so narrow our medical outlook that we have ceased to be physicians. If the present tendencies are earnest of the future, such an aspersion can never again be justly made. We have passed beyond the point where a narrow dogmatism can ever again dominate the ophthalmic conscience.

I have tried to show that there is scarcely an avenue of investigation that may not require exploration. I have dwelt upon the advantage of endeavoring to attain a most comprehensive knowledge of our patients' entire organism. Emphasis has been placed upon the onerous value of collaboration between ophthalmologists and workers in other fields to the end that diagnosis may be more exact, prognosis more accurate, and therapy more effective. We have been told by our confreres in other branches of medicine that ophthalmology is the most exact and satisfying of all the special lines of medical practice. Yet we must confess that there is still much that is dubious, much that is vague and unsatisfactory in our daily work. Why is this so? Will it not be found, in the final analysis, that our uncertainty and dissatisfaction arise from incomplete knowledge, from a feeling that we are still groping in the dark?

The ophthalmology of the future will be builded upon substantial foundations. It will rear itself solidly and will not disdain to receive as structural units the stones of knowledge contributed by its sister branches of medicine.

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# A CASE OF SYMPATHETIC CYCLITIS WHICH COMPLETELY RECOVERED.

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The pathology of sympathetic ophthalmitis, as it is usually called, is so obscure and the factors which cause it are so uncertain that it is advisable that as many examples as possible should be carefully recorded. The following case presents many unusual characteristics. The history of the accident, combined with the corneal scar and the rupture of the anterior capsule with fluidity of the lens, led to the diagnosis that there was a foreign body in the eye. Unfortunately at this time I had no means of getting a good X-ray photograph of the head, which might have led me to a correct diagnosis. As a matter of fact, no foreign body was found in the eye. We must, therefore, assume that the eye was pierced by a sharp spicule of coal or iron, which did not remain in the globe. When first seen the eye was so angry looking that it was regarded as certainly infected. As soon as it was obvious that it was useless and dangerous, excision was repeatedly urged and refused. The patient went home, but seven weeks later returned with symptoms of sympathetic irritation, symptoms which rapidly passed away, lasting only for a day. The exciting eye was now enucleated. A week later sympathetic cyclitis commenced. It was of a mild type characterized by extensive keratitis punctata and infiltration of the vitreous. At one time vision was reduced to finger counting, and the ophthalmoscopic view of the fundus was lost. There was never any optic neuritis. A year's treatment with mercury, administered subconjunctivally by injection and by the month resulted in a complete and apparently permanent cure.

The clinical history of the case is the following: On Feb. 25. 1907, A. L., a miner, aged 31, came to the hospital at Coventry suffering from an accident to his right eye. Three days previously he was splitting coal with a steel wedge and a heavy hammer, when something flew into his eye.

Present Condition.—There is a small scar centrally placed in the cornea, and corresponding to this is a tear about 1.5 mm.

long in the anterior capsule. The iris is entangled in this tear, forming a posterior synechia. The lens is swollen and bulged forward, and is quite opaque. No trace of any foreign body can be seen in the lens, or elsewhere in the eye, but it is almost certain that a piece of steel or coal has entered the globe. R. V. = hand reflex; good P. L. and projection. Tn. Considerable ciliary injection of the globe, but no pain. A powerful hand magnet brought close to the cornea causes no sensation of pain.

TREATMENT.—March 1. It was hoped that the foreign body was in the lens, which was allowed to flow out through a large indectomy incision. The iris became impacted in the wound, so an iridectomy was performed. No foreign body was found in the lens matter, which was quite fluid. An attempt to remove the foreign body wtih the hand magnet failed.

March 12. The eye is much injected, and there is no red reflex. X = hand movement.

March 15. Eye still more injected, patient strongly advised to have eye removed. He refused, and left the hospital with the eye in a highly inflamed condition. Tn.

March 22. A little less injection; V = fingers at 1 metre. some red reflex. Tn. — 1/2.

April 10, or seven weeks from the accident. There is slight lachrymation of the left eye, and slight pericorneal injection, but no K. P. or sign of iritis, no optic neuritis. V. R. = fingers at 1 meter Tn. — 1.

V. L. under atropin + 1.5 ○ + 1.0, 90° = 5/xv.

Patient was admitted and the L. eye got fully under atropin.

April 11. The signs of "sympathetic irritation" have all disappeared. There is no K. P. or other sign of cyclitis. The right eye shows ciliary injection, and posterior synechiæ. It is tender, Tn. — 1.

April 12. As all signs of sympathetic trouble had disappeared from the left eye the R. eye was excised. No trace of a foreign body was found in it, nor was there any scar in the sclerotic where it might have perforated.

April 14. Patient left the hospital. The left eye was then normal.

April 19. A week after the excision patient came up complaining that he had a foreign body in his left eye.

Condition.—Slight ciliary injection, photophobia and epiphora. The iris looks healthy, is not muddy, nor are its veins engorged, mobility of pupil unimpaired.[*] The back of the cornea is thickly peppered with a very fine pigmented K. P. The disc margins are clearly defined, no engoragement of retinal vessels.

Patient was admitted again and treated with atropin. He had a subconjunctival injection of mecuric oxycyanide 1-5000 with a few drops of a 1% solution of acoin. This was repeated two days later and caused no pain.

April 25. Injection less, but more K. P.; some of the deposits are now larger and are unpigmented. There is no trace of optic neuritis. V. L. $+ 1.5 \mathbin{\overset{\frown}{\smile}} + 1.00, 90^\circ = 5/\text{xx}$.

April 26. Much more c. c. injection. The vitreous is getting muddy, and the fundus details are becoming obscured. A small synechia seen at lower edge of the fully dilated pupil.

May 1. Patient discharged himself.

The subsequent history can be stated shortly. The media became more and more opaque till the disc could be no longer seen, but there was never as long as any optic neuritis was visible. The K. P. became very dense, but there was never much injection, pain or rise of tension. No exudate at pupil margins. The eye was kept under atropine and mercury ointment rubbed into the lids twice a day. Liq. hydrarg. perchlor. was given internally.

July 10. There is a definite improvement. The disc is now clearly seen; there is less K. P.

August 14. The disc is now clearly seen; there is no optic neuritis, K. P. clearing up.

Nov. 27. All fundus details seen; no evidence of any inflammatory changes. No synechiæ, no K. P., no vitreous opacities. V $+ 1.5 \mathbin{\overset{\frown}{\smile}} + 1.00, 90^\circ = 5/\text{x}$.

January 8, 1908. V. L. $+ 1.00, 90^\circ = 5/\text{vi}$. The atropine has been discontinued. The eye is, as far as can be ascertained, absolutely normal.

January, 1909. During the last year patient has been seen at intervals. His eye remains perfectly sound.

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[*] It has been stated that optic neuritis is always present in sympathetic ophthalmitis. In this case there was never a sign of it.

[*] Patient had not used the atropine which was ordered.

# *Abstracts from Recent Ophthalmic Literature*

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## AMBLYOPIA AND BLINDNESS.

Snow Ophthalmia (Ophthalmia Nivalis).—Gonin (*Annales d'Oculistique,* September, 1908).

Gonin finds so-called "snow-blindness," as observed by ophthalmologists, less frequent than is usually supposed.

On inquiry of the Swiss Alpine Club, he finds that conjunctival irritation with photophobia and blepharospasm is frequent, but generally of so mild a character that the patients recover in a few days without consulting a specialist.

Guides and tourists have learned to provide themselves with protecting glasses and their eyes are not generally affected unless the difficulties of the route compel them to lay aside the glasses, or they suppose they are not necessary in a misty atmosphere.

When the eyes have been exposed to reflection from the sun for some hours the symptoms of ophthalmia are those that Reich has described as affecting workmen occupied in clearing the roads; viz., the eyelids and conjunctiva are red and a little swollen, the pupils are strongly contracted, there is slight congestion of the retina, and intense and painful photophobia.

The supposed blindness that has been described is due chiefly to spasm of the lids and when these are once opened, vision is found to be little or not at all diminished. The visual field was affected in only two of the subjects examined. Ulceration of the cornea has been observed, but it is rare.

The symptoms do not occur suddenly, like the retinal dazzling from looking at the sun or at a brilliant electric light, but some hours later, most frequently in the night or on awakening in the morning. The symptoms generally yield promptly to iced compresses or hot stupes, protection from the light and applications of sulphate of zinc. Some patients get relief from applications of white of egg to the conjunctiva. Exceptionally, there is a persistent dimness of vision, which the author is disposed to attribute to continued myosis and which yields to darkness and cocain or atropia.

He has noted in fifty cases only two in which visual troubles resulted from probable retinal causes, and thinks that the expression "snow blindness" (*schneeblindheit*) is incorrect. It is better to speak of snow ophthalmia as we do of electric ophthalmia. These affections are analogous not only in their symptoms, but in their cause, which, in all probability, is the action of violet and ultra-violet rays.

Widmark demonstrated that the luminous rays of the spectrum have no decided action on the conjunctiva or cornea, and the calorific rays but little; while isolated ultra-violet rays produce chemosis of the bulbar conjunctiva, epithelial desquamation of the cornea, myosis, and sometimes discoloration of the iris. He also showed that it is not the direct influence of the sun that produces snow ophthalmia, but rather light reflected by the snow, which is richer in ultra-violet rays than is direct run light.

The fact is confirmed by experience, as a large proportion of reported cases of snow ophthalmia have occurred in cloudy weather or even at the time of a dense mist.

There is a decided individual difference in susceptibility to snow ophthalmia. While slightly tinted glasses suffice to protect some people, dark smoked prove insufficient protection for others. Dark smoked glasses are inconvenient and the author prefers those of yellow tint which absorb the ultra-violet rays. He has personally found them a sufficient protection. Even ordinary plain glass intercepts a considerable proportion of the ultra-violet rays, and many people escape snow ophthalmia by wearing the correction of their ametropia. These rays are also intercepted to a considerable extent by the lens.

The irritation of the external integuments of the eye is not due, as was formerly thought, to reflex action from retinal excitation, but results from direct action of the injurious rays upon the eyelids, the conjunctiva, the cornea and the iris. Protecting glasses should have wire gauze or glass sides to obstruct the oblique rays of light.

Erythropsia, in the production of which the ultra-violet rays act an important part, sometimes results from snow reflection, and may occur without accompanying irritation of the conjunctiva or cornea. G. C. H.

## ANOMALIES.

A Case of Persistent Capsulo-Pupillary Membrane in Both Eyes.—Massey, A. Y., Saint John's, Newfoundland (*Ophthalmoscope*, Nov., 1908). A girl of 11 years, with a normal family history, presented eyes with defective vision, small cornea and threads of persistent membrane hanging as festoons in the pupils. They take their origin a short distance from the margin of the pupil and find their insertion in the capsule of the lens. M. B.

A Case Exhibiting a Symblepharon, Corneal Opacities, and a Probably Fibro-Fatty Tumor of the Conjunctiva, All of Prenatal Origin, in a Woman With Hereditary Cataracts at an Early Age.—Chance, Burton, Philadelphia (*Arch. Ophthal.*, Nov., 1908, xxxvii, 680), gives the clinical history of a patient, aged 52 years, who had hereditary cataracts and a congenital fibro-fatty tumor and symblepharon. The tumor mass originated from the retrotarsal folds, was adherent to the globe, crossed the limbus and ended in a dense white line in the cornea. The surface of the tumor was smooth and conjunctival in appearance. Beneath the upper lid the retrotarsal fold was bridged across by a broad symblepharon which was attached to the cornea 3 m.m. within the limbus. At its attachment to the cornea was a dense white line.

The opposite eye showed a dense, white, scleral tongue which extended 3 m.m. within the limbus ending in the cornea in a dense white line similar to that in the first eye.

The author regards the opacities and adhesions as inflammatory in origin.

The lenses were opaque and extraction of the left lens gave ultimate vision of 5/v, with correcting lens. W. R. M.

## BACTERIOLOGY.

The Existence of Bacterial Flora in the Physiologic Conjunctival Cul-de-sac of the Newborn.—Rosenbauch (*Bericht der Akademie der Wissenschaften in Krakau*, 1909). The author examined the conjunctival cul-de-sac of 200 new born children, bacteriologically, and gives the following conclusions:

1. The conjunctival cul-de-sac is absolutely clear immediately after birth.

2. The first micro-örganisms are to be found 24 hours after birth.

3. After 24 hours the bacterial flora is constant.

4. Is not to be differentiated from that of the adult.

5. Constant inhabitants of the sac are: Staphylococcus albus non pyogenes non liquefaciens and bacillus xerosis.

6. Other microbes are only sporadic.

7. Pathologic micro-örganisms are seldom found and then in small amount.

8. Twenty-four hours after birth the author had never found a conjunctival sac free from micro-örganisms.

9. Gonorrhoeal infection of the conjunctiva is hardly possible during birth, but usually occurs during the first couple of days of life. K. W. M. Translated by H. V. W.

Researches Upon the Microlbiology and the Parasitology of the Cilia.—Fava (*Annales d'Oculistique,* August, 1908). Fava examined for micro-örganisms, the roots, the middle portions and the ends of cilia.

The microbes found belonged, for the most part, to the aerobic class and only exceptionally to anaerobic. In tubes sowed with cilia before disinfection of the lid margin, fifty colonies were obtained from the roots, thirty from the middle parts, and fifteen from the extremities. Cultures made with cilia taken after disinfection were sterile.

In cases of blepharitis there was an average of ninety cultures for each tube.

Among the aerobic microbes the staphylococcus albus was found frequently, but the author doubts if it plays a part in the etiology of affections of the ciliary border.

The bacillus subtilis was found once in the root, three times in the middle part, and four times in the end.

Of the two anaerobes isolated, one came from the root and one from the end of the cilium.

The saprophytic microbes most frequently met with are capable of causing grave inflammation symptoms of the globe when ioculated in the posterior chamber of the eyes of animals.

The parasite most frequently met with is the demodix folliculorum of Simon, which is found in the root of the cilium. It has no pathogenic power, but may act as a foreign body in dilating the ciliary follicle and thus favoring the entrance of microbes. G. C. H.

Conjunctivitis Associated With Bacillus Pyocyaneus in an Adult: Bacillus Pyocyaneus Found in a Normal Conjunctival Sac.—Pusey. Brown. Chicago (*Arch. Ophthal.*, Nov., 1908, xxxvii, 683), reports two cases of infection of the conjunctival sac with the bacillus pyocyaneus. In the first case there was a marked conjunctivitis present.

In the first case the conjunctiva of the lids was swollen and red and numerous follicles were present in the transitional folds. The bulbar conjunctiva was also inflamed. There was no discharge from the eyes. Cultures showed large colonies of the bacillus pyocyaneus and small colonies of the staphylococcus albus. Bouillon culture injected intraperitoneally in a guinea-pig caused death in twenty-four hours, while the same culture in the conjunctival sac of a rabbit caused no reaction.

In the second case the patient complained of some itching and burning of the lids, but there were no objective signs of conjunctivitis. Cultures from the conjunctival sac showed bacillus pyocyaneus in pure culture.

Zinc sulphate was used and at the end of two or three weeks the organisms had disappeared.

The author found five cases of conjunctivitis due to bacillus pyocyaneus reported in literature, but all were in new-born children. W. R. M.

CONTRIBUTION TO THE ACTION OF PFEIFFER'S INFLUENZA BACILLUS IN THE EYE.—FISCHER, TH., Wein. (From the eye clinic of Prof. Th. Axenfeld in the University of Freiburg, *Klinische Monatsblaetter fuer Augenheilkunde,* xlvi, 2, 1908, p. 374.) A case of panophthalmitis, which is reported, suggested to F. experimental investigations with regard to changes in the interior of the eye by Pfeiffer's influenza bacillus. The pus, obtained from a panophthalmitic globe, contained staphylococci, xerosis bacilli and influenza bacilli. The influenza bacilli were cultivated with xerosis bacilli on pepton agar and the cultures injected into the anterior chamber, vitreous and a pocket of the cornea, of rabbits. The records are given in detail with the following conclusions: The influenza bacillus, injected into the interior of the eye, may produce serious inflammations. The inflammation is not caused by toxins, developing from the disintegrating bodies of the dead bacteria, but the influenza bacilli multiply rapidly in the vitreous. This is an interesting instance, that in the vitreous germs, not pathogenic for the species of animal, may be pathogenic. Under these circumstances the faculty must be conceded to the hemophilic Pfeiffer's bacillus to produce wound infections, e. g. after cataract extractions. The inflammatory reactions ceased with the disappearance of bacteria. A pathogenic action on

the cornea and conjunctiva of animals was not demonstrable.
C. Z.

## CASUISTICS.

Notes on the Examination of the Eyes of 3094 Village School Children. (*The Ohio State Medical Journal*, January 15, 1909.) The following statistics of the examination of the school children of East Cleveland Village and Lakewood, Ohio, are given:

| | No. | P. C. |
|---|---|---|
| Total number examined | 3494 | |
| Number with abnormal vision for distance | 420 | 13.57 |
| With excessive farsight (usually with astigmatism also) | 225 | 7.27 |
| With nearsight (usually with astigmatism also) | 176 | 5.69 |
| Having glasses when first examined | 168 | 5.43 |
| Estimated as needing glasses | 374 | 12.1 |

The showing for village children is better than for city children, as it is estimated from examinations made by the teachers of the city children of Cleveland and a large number examined by Dr. L. R. Baker, that 15 or 16 per cent. of them would be benefited by accurately fitting glasses. M. D. S.

## CATARACT.

Concerning Specific Treatment in Incipient Senile Cataract.—Konigshöfer, Stuttgart (*Die Ophth. Kl.*, Sept., 20 and Oct. 5, 1908) calls attention to the fact that during the period between Oct., 1897, and April, 1901, he experimented upon incipient senile cataract with animal lenses prepared so that their bio-chemic properties were unchanged. When so prepared the result was a white tasteless, odorless powder. He employed this in a large number of cases over long periods of time, but abandoned it because the results were not definite enough to be free from the criticism that they might have been spontaneous. W. Z.

Cataract Extraction.—Elliot, Robert Henry, London, Eng. (Report of Dec., 1908, meeting of the Ophth. Society of the United Kingdom, *Brit. Med. Jour.*, Dec. 19, 1908.) The writer confined his remarks to four main points: (1) The antisepsis of the conjunctival sac. In his last 1,000 cases he had combined Col. Herbert's method of irrigating the conjunctiva with 1 in 1,000 per-chloride solution with his own of carefully cleansing the sac with sterile cotton-wool mounted on small sticks under a stream of boiled water. In this series there was only one case of suppuration, and this was due to a suppurating lacrimal sac which had been incompletely removed by another surgeon and was overlooked. The index of sepsis destruction of vision was 0.42 per cent., while if a doubtful case were eliminated it fell to 0.275 per cent. The index of total septic incidence stood at 1.06 per cent. He was strongly of opinion that the methods of operation were of little importance compared with the vital necessity of keeping the wound area aseptic. (2) The laceration of the lens capsule with a Bowman's needle before making the incision. For precision and safety in effecting the needling, for the easy sterilization of the needle, for the valuable information gained regarding the consistency of the cataract, and the size of the incision required, he considered the method had no equal. Leakage of the aqueous need never occur if the needle shank were as large as the blade, and it was more useful in the Morgagnian cataracts than in any other, as the fluid deepened the anterior chamber, and indicated by its volume the size of the nucleus, while the milky fluid which escaped made no difference to the view the operator had of his knife. (3) The question of the remote danger of vitreous escape attending extraction. He greatly dreaded this complication in deference to the usually-held European opinion. His own experience of it was small, being only 3 per cent. in cases in which the capsule was not removed subsequent to the extraction of the lens. If it could be shown that the dread of remote complications were unfounded he thought that there would be much to be said in favor of the intracapsular operation. (4) The value of intraocular irrigation by McKeown's method. He had used it in upwards of 5,000 extractions, and the whole series of 1,000 cases mentioned above had all had this method applied. This showed it to be free from danger provided the operator is clean and careful. He considered it one of the great advances in the perfection of the technique during recent years. It was valuable alike for removing cortex of any description from the eye, and for safely and quickly completing the toilet of the wound. C. H. M.

TREATMENT OF IMMATURE CATARACT.—SMITH, HENRY, Jullunder, Punjab, India (*Arch. Ophthal.*, Nov., 1908, xxxvii, 672), considers the capsultomy operation as unsuitable for immature cataracts, and the various methods of ripening operations as either dangerous or disappointing.

The author discusses the various procedures commonly adopted for ripening an immature cataract and adds that puncturing the lens capsule is either liable to be a failure in establishing a traumatic cataract or a traumatic cataract so established may be a serious ophthalmic emergency. Iridectomy, in his opinion, has no influence whatever on the maturing process. Iridectomy with massage through the cornea, the author has done extensively, and in his experience it has no influence on the maturing of immature cataract, if the massage be done with a justifiable degree of pressure. Iridectomy with direct massage of the lens, the author considers a daring and unsafe procedure. He considers extraction of the lens in its capsule as admirably suited to immature cataracts and practices it extensively.

The stage at which he advocates extraction of immature cataracts in the capsule is that stage in which the cataract unfits the subject for his ordinary duties. Atropin is not necessary on account of the infrequency of iritis following the operation.

The author's experience extends to about 20,000 cataract extractions, about 17,000 of which have been in the capsule, and among them many immature cataracts. W. R. M.

ON SOME DISTURBANCES IN THE COURSE OF HEALING AFTER CATARACT OPERATIONS.—PETERS, A., Rostock. (*Zeitschrift fuer Augenheilkunde,* xx, 1908, p. 334.) I. Keratitis bullosa through degeneration of the endothelium. On the 2nd day after a cataract extraction in a man aged 70, a striped keratitis developed, which after 2 weeks was complicated with relapsing formation of vesicles, which finally subsided under pressure bandage. P. assumed a globular degeneration of the endothelium (Drusen) which probably was damaged by the somewhat laborious extraction of the lens, so that an opacity of the cornea was caused by imbibition with aqueous. P. mentions the recent experiments of Erdmann, who produced in rabbits changes of the endothelium with dimethyl sulfate, followed by typical bullous keratitis.

II. Kerato-iritis by too high a percentage of alkaline in solutions of oxycyanide of mercury. After 8 cataract operations and 3 iridectomies P. observed kerato-iritic complications which could not very well be due to infection. Finally he found that the cyclitic irritation was due to the alkaline contained in the oxycyanide solutions which were made of tablets containing 1.03 oxycyanide of mercury and 1.04 carbonate of potash, giving a concentration of 1.1000. As soon as the solution was made merely of oxycyanide of mercury 1.3000 no further postoperative cyclitis was observed.

III. Headache after cataract operations. Ciliary pain in the forehead and eye, like those in iritis, are sometimes observed after cataract extractions. If, after a careful inspection of the eye, iritis can be excluded, P. advises to palpate the exit of the supraorbital nerve, which may show a sensitiveness like in asthenopia of various causes. This may be due to predisposition to headaches after excitement, constipation or gouty neuralgia. In such cases the usual nervina, as antifebrin, etc., or quinin and iron, generally give relief. C. Z.

Changes in Refraction in the Beginnings of Cataract.—Machek Prof. (*Postep Okulistyczny* No. 3, 1908). It has been known for a long time that the cloudy lens is accompanied by increased refraction, so that in the case of a previously emmetropic eye so-called Myopia Ex Cataracta Formanda arises. The author has observed in one of his patients an exactly opposite condition, i. e., a lessening of the refraction in the early stages of cataract.

The patient was myopic 2, O D. and 20 years later the left lens began to opacify, the myopia being reduced to 1.75 D.

The contemporaneous change in the refraction with the opacification of the lens shows that the refraction change depended upon the lens, and he believes this to often occur, but is generally overlooked. Observation of the refraction in cases of beginning cataract is usually only made where the opacity occurs in the equatorial zone; even in this stage the visual acuity may not be reduced sufficiently for the patient to consult an oculist. The author cites the work of Hess, who had observed in beginning cataract the capsular epithelium of the lens became sclerosed and in closer connection with the lens fibers; from this the lens is flattened and its refraction power is reduced. The same observation had been made by Priestley Smith, who took normal and opaque lenses showed that the latter had lessened power.

The coefficient of refraction of the lens is the greater the more differentiated from the coefficient of the cortex, the layers from the nucleus. Should the refraction coefficient of the opacifying cortical masses appreciably increase, so must the lens *in toto* lose this much.

Deutschmann and Jacobsen show a loss of liquid in the first stages of cataract formation which cause a partial loss of lens refractive power. The filling up of the lens by imbibition occurs much later, when the increasing opacification not only reduced the acuity but likewise causes changes in the refraction impossible to observe. K. W. W. Translated by H. V. W.

## CHORIOID.

THE ETIOLOGY OF CHOROIDITIS.—LAWFORD, J. B., London (*Ophthalmic Record*, Nov., 1908). Credit should be given to syphilis as the important cause of chorioidal disease, but we should not do more than this. He believes that other altered systemic conditions play a most important roll in the etiology, namely, tuberculosis; auto-infection; certain systemic diseases, as enteric fever, malaria, several of the exanthems, influenza, systemic gonorrheal infection, many of the anëmias, gout; certain occupations, such as workers in naphthalin; diseases of liver and kidneys. There are a certain number of cases of chorioiditis in which no apparent cause can be found. M.B.

RETINOCHOROIODITIS JUXTA-PAPILLARIS.—JENSEN-EDMUND. Copenhagen (*Graefe's Arch.*, lxix-H. 1, Aug. 28, 1908), the author describes as a heretofore undescribed condition an affection previously written upon by Hill Griffith (Ball's Modern Ophth.) and others. All four of the author's cases agreed in the following particulars: The disease occurs without apparent cause in young, healthy individuals without syphilis or other demonstrable constitutional dyscrasia. Objectively it presents a whitish, slightly prominent infiltrate about the size of the papilla of oval form; the infiltrate lies in juxtaposition with papilla nervi optici. In the author's first case at the upper margin, in the third case at the upper-inner and in the second and fourth at the lower margin. It affects the retina as well as the chorioid. The retinal vessels are entirely or in part covered. As the result of chorioidal involvement there are fine vitreous opacities. The remaining portions of the fundus are entirely normal. The subjective symptoms arise in part to the opacities in the media, producing a blurring of the vision and in part to the existence of a periphery, in which area all perception is lost. The author is unable to decide from his own cases whether this developed suddenly or gradually or whether it was at first relative and later absolute. In all cases the scotoma was absolute at the time of the first examination. How long the disease had existed before this time could not be determined, as the accompanying disturbance of vision was slight, the vitreous opacities being apparently the first symptom to attract the patient's attention. In the subsequent course of the disease the infiltrate gradually disappeared from the periphery, in and the affected part assumed the appearance of a subsided retinochorioiditis. The absorption took place slowly, lasting a few months. The vitreous opacities also disappeared, but the defect in the field persisted unchanged in extent or intensity. That the disease may relapse was proven by one case in which recurrence took place twice, affecting the same area over again. The prognosis as to sight is good.

The affection does not represent the accidental location of the lesion in disseminated chorioditis is proven by the fact that there was no evidence of other portions of the fundus having been previously or later affected. As to the primary seat of the lesion whether in the chorioid or retina is not known. The situation of the lesion suggests the source of the origin in the anterior part of the vaginal sheath of the nerve. He believes that the visual field defect is due to the action of the exudate which produces a thrombosis of the arterial vessels within this area and consequently the area supplied by these vessels is deprived of perception. In support of this it was found after absorption of the exudate that the underlying artery was very much contracted and in the fact that obstruction of a branch of the central artery of the retina produces a similar embolic defect in the field. He believes that the initial condition is one of inflammation of the retina and choroid. He has seen it four times in 26,800 cases.

W. Z.

## CIRCULATION.

The Relation Between Retinal Hemorrhages and High Arterial Pressure.—Fox, L. Webster, and Batroff, W. C., Philadelphia (*Ophthalmic Record,* Oct., 1908). One hundred cases are reported and presented in tabulated form. 80% of the hemorrhages occurred in diseases in which hypertension is the rule. 40% were found to have chronic interstitial nephritis; 27% arterio-sclerosis, and 13% chronic parenchymatous nephritis. These figures suggest that diseases of the kidney should be considered first. Anemia—simple, pernicious and leukemic—made up 6%. The blood pressure with one exception was subnormal. 4% of the cases were lithemic, with moderate hypertension: the hemorrhages were all subconjunctival. 2% were from autointoxication with hypertension. One showed hemorrhage, the other retinal edema. Diabetic retinitis with hemorrhages furnished 2%; in both the blood pressure was subnormal. Secondary syphilis was the etiological factor, in neither was the blood pressure unduly. The single instance in which aneurism was the only ascertainable cause, failed to manifest any abnormality of the blood, blood pressure, or the kidneys. The author feels quite sure that the increased arterial pressure is an important factor in the causation of glaucoma. In one case where the b.p. was 265 cmm., twenty ounces of blood were taken from the right arm reducing b.p. to 150. The pupil and tension, previously unaffected by eserine, came down at once, permitting an iridectomy to be performed. All plethoric cases and those with greatly increased tension were admitted to the hospital and immediately bled until the b.p. was reduced to well within bounds of safety. In less robust, somewhat anemic cases, the hypertension was reduced by hot baths. In the obese, and when, for any reason, bleeding was refused or impracticable, thyroid extract gr.ii, t.i.d., was of use as a vasodilator and to diminish the viscosity of the blood. The latter methods did not tend to produce the immunity to recurrence of hemorrhages as did bleeding. The latter enabled a number of chronic nephritics with whom retinal hemorrhages had been habitual for months, to go two years without a recurrence. Within 24 hours following the bleeding the b.p. recorded higher than before the bleeding, and then there was a daily decline of 10 mm., for three or four days, and the final pressure was maintained as long as the patients were under observation. The routine treatment after the patient left the hospital was carefully regulated nitrogenous diet, alkiline waters freely and warm baths, 110° for ten minutes, thrice weekly. Medicinal arterial relaxants were used. M. B.

PRE-RETINAL HEMORRHAGE.—NAGEL, C. S. G., San Francisco (*Jour. Ophthal. and Oto-Laryng.*, Jan., 1909, iii, 1), prefers the terms pre-retinal as describing that form of hemorrhage in which the blood is present between the retina and vitreous, and believes that an exact diagnosis is sometimes not made. He refers to the appearance of the fundus, in typical cases, where the hemorrhage shows a horizontal straight outline at its upper border, changing its position with change in position of the eyeball, and calls attention to the fact that this is not the constant appearance in all cases and that, where present, it does not always persist throughout the whole course. The most frequent site of the hemorrhage is over the macula, but cases have been reported where the hemorrhage has been merely outside of the macula.

In regard to the etiology, the author accepts Haab's conclusion that every possible cause for retinal hemorrhage may bring about a hemorrhage between the retina and vitreous, but believes that anemia and menstrual anomalies are, relatively often, causitive factors.

The author gives a favorable prognosis: the blood being absorbed in 3 to 6 months with resulting normal vision.

The clinical history is given of a case occurring in the author's practice. Patient had a pre-retinal hemorrhage, in the macular region, in the right eye and occurring at the beginning of her menstruation. Twenty-eight days later, with returning menstruation, the left eye became similarly affected. Recovery resulted in both eyes in from 7 to 10 weeks.

As regards an anatomical basis for these hemorrhages the author refers to Marcus Gunn's theory that the hyaloidea is not as firmly attached to the retina in the macula as elsewhere and also to Dimmer's explanation that "in the macular region Mueller's fibres frequently split into 2 or 3, some distance from the inner surface of the retina. The inner ends of these secondary fibres then, as they form the margo limitans, being much finer than the conical endings of Mueller's fibres, elsewhere render it easier for a hemorrhage to break through at the macula."

Aseptic Cavernous Sinus Thrombosis.—Pigeon, W. H., Hull, Eng. (*Brit. Med. Jour.*, Dec. 12, 1908.) The writer describes a case of this sort occuring in a man of 45 suffering from a compound fracture on each side of the lower jaw. After satisfactory progress for six weeks subconjunctival edema appeared in both eyes, and in the course of a few days the lower lids became widely everted by the edematous palpebral conjunctiva. The ocular conjunctiva was chemosed, eyeballs protruding and almost immobile, but vision good. There was no pyrexia, no cerebral disturbance, no tenderness in the mastoid and jugular regions, and the patient's condition was not anaemic or marasmic. The symptoms pointed to aseptic thrombosis of the ophthalmic veins and both cavernous sinuses.

The probable causes of the thrombosis were: 1. Increased coagulability of the blood from excess of calcium salts taken in the milk diet during six weeks. 2. Interference with the circulation in the frontal veins and the communicating branch with the ophthalmic veins by a band encircling the head, applied to keep in place the tailed bandage supporting the lower jaw.

Various drugs were tried to assist in dissolving the clots —citric acid, ammonia and potassium iodide; also a diet free from salt. The condition remained unaltered for four months, except for temporary subsidence from escape of serum through punctures made in the conjunctiva. Thyroid extract in 5 grain doses every other day was then tried, and was followed by a marked subsidence of the swelling in two weeks. After that progress was slow, and it was not until a year after the accident that the everted lids returned to their proper positions. Six months later there was still some edema, fullness of conjunctival veins, slight prominence of eyeballs, and diplopia owing to weakness of the internal recti. C. H. M.

## CORNEA.

A Further Note in Reference to Greenish Coloration of the Cornea.—Salus, Prague (*Wochensch. f. Therap. u. Hyg. d. Aug.*, Dec. 3, 1908), points out that his case of coloration of the cornea differed from that of Senn's in color, location and nature of opacity. It was brownish-green and situated in an annular form at the periphery and in the deeper layers of the cornea, whereas in Senn's case the opacity was sepial brown and occupied the fissural space. It was superficial with serous elevations of the overlying epithelium. The conjunctiva was also stained. A further study of Salus' case by Simm has convinced him also of the different nature of the two conditions. W. Z.

Therapy of Serpiginous Ulcers of the Cornea With the Galvanocautery.—Vasek, E. (From the eye clinic of Prof. J. Deyl in the Bohemian University of Prag. *Zeitschrift fuer Augenheilkunde,* xx, 1908, p 520.) After a very complete critical review on the various methods of treatment of corneal ulcers, V. reports in detail 64 cases which, from the first stage, were systematically treated with galvanocautery. 48 out of these were examined bacteriologically. In 40 pneumococcus was found either alone or with staphylococcus, in 2 staphylococcus alone, in one staphylococcus with sarcina, in one Bacterium liquefians of Petit, and in one bacillus zur Nedden.

His conclusions are: 1. The cauterization of serpiginous corneal ulcers is so far the most reliable means to arrest their progress. 2. The ulcer must be cauterized in the first few hours, if its progressive character is apparent, as then the cauterization is most reliable, but a correctly performed cauterization generally suffices in extended ulcers. 3. Any ulcer which commences to assume a serpiginous character must be considered as serious, as we are unable to determine from the clinical aspect the degree of virulence and the prognosis. 4. The cauterization must be especially thorough if the infiltration pervades all strata of the cornea or extends to the limbus. 5. The opening of the anterior chamber with the galvanocautery has no advantage over the puncture with the lance-shaped knife. 7. In blennorrhea of the lacrimal sac this must be extirpated. 8. After extended cauterizations the patient must keep very quiet for some time, as perforation may take place as late as the 3rd week. C. Z.

Clinical and Patologico-Anatomic Contribution to Our Knowledge of Degenerative Diseases of the Cornea.—Gilbert, Munchen (*Graefe's Arch.*, lxix, H. I., Aug., 1908). The various degenerative processes of the cornea in blind eyes showing increased T. or the sequellae of increased T. may be divided into two groups. The first group have in common destructive processes in pre-existing tissues with secondary preliminary reparative processes the direct consequence of glaucomatous conditions. The second group includes the clinical pictures which form the anatomic findings are considered the result of the deposition of the products of a local disturbance of metabolism, particularly band-like corneal opacities and leucoma with calcareous and hyalin deposits. Often one finds the two conditions associated, but always with a preponderance of either type.

From his own histologic studies and those of others, he concludes that there may exist a well marked degenerative pannus without it having a clear clinical existence in eyes blind for many years because the absence of vessels and the poverty of cells in pannus the transparence of the cornea is not affected. The anatomic study of the author's cases reveals further explanation for clinical degenerative pannus. The fact that this pannus was found in an eye that possessed the clinical picture of *keratitis bullosa* appears to show a certain relation between the formation of the blebs and pannus in that the one excluded the other: where the subepithelial pannus develops the strongest there is found no degenerative change in the epithelium and vice versa where epithelial degeneration prevails the pannus layer is only poorly developed indeed is usually entirely absent.

Where in *K. bullosa* pannus formation is demonstrable it may be looked upon as an anatomical reparative process. That both processes are found in the same eye indictes that the eye was removed because of the painfulness of the bleb and other degenerative processes before the anatomic healing was completed and the stage of bleb formation passed.

Interstitial edema is the beginning (steamy opacification of the cornea) and crypt formation the result of degeneration of the epithelium and *K. Bullosa and vesiculosa* the acme of the process. Anatomical cure may be brought about by the formation of pannus.

The underlying anatomic cause of keratitis bullosa is therefore a dropsical swelling of the epithelium with subsequent degeneration with intra- and sub-epithelial vacuolization as well as a specific degenerative process in the epithelium. Other authors have found an elevation of the epithelium from the formation of a fluid so that it seems evident that the terms *keratitis bullosa* and *vesiculosa* based on clinical appearances have no anatomic justification. Moreover it is an anatomic and mechanic condition (interference with the circulation of fluid) which leads to the formation of blebs and in no way is it a true inflammatory process. The investigation shows that the anatomic picture is not a unity, but this does not justify the introduction of new terms which still do not cover the anatomic findings, such as *bullous* and *cystoid degeneration of the corneal epithelium* (Klebs).

With our present knowledge it is not possible to determine clinically whether there is vacuolization of the epithelium or elevation of a more or less normal epithelial layer by underlying fluid effusion. From the examination of 6 eyes the author is not convinced that the latter is an important factor. But the findings of Fuchs tends to show that the lifting up of the epithelial layer from the anterior limiting membrane may be due to the formation of a new-formed subepithelial membrane.

Notwithstanding what his and other investigators' studies show the author curiously enough believes it most proper to retain the nomenclature *keratitis bullosa.* W. Z.

NODULAR OPACITY OF THE CORNEA IN THREE GENERATIONS. —FOLKER, HERBERT H., Stoke-on-Trent, Eng. (Report of Nov. meeting of Ophth. Soc. of the United Kingdom, *Med. Press*, Nov. 25, 1908.) Twenty-five members of this family had been examined, and the opacity was found in nine of them. In the first and second generations, five were examined, and nodular opacity was present in three members. In these cases, in addition to the opacities, fine lattice-like lines were found in conjunction with them. This latter condition was absent in members of the third generation. The nodular opacities were fewer in number and less in density in the younger members. In all the cases the opacities appeared to be situated in the anterior layers of the substantia propria, but epithelial layer not being involved. No signs of syphilis or history of rheumatism were present in any of the cases. C. H. M.

RECURRENT TRAUMATIC EROSION OF THE CORNEA—REPORT OF A CASE DUE TO LACRIMAL STRICTURE.—CURDY, R. J., Kansas City, Mo. (*Ann. Ophthal.*, Oct., 1908.) A woman of 28 years gave a history of having scratched the cornea two years before with the point of a fern leaf. During the past six months there had been marked exacerbations and remissions, and occasionally short intervals of almost entire absence of symptoms. There was constant discomfort, but pain only for about two hours after awakening. Treatment proved of no avail until it was discovered that she had an occlusion of the lacrimal duct. After this was corrected by probing, all symptoms of corneal irritation disappeared. M. B.

Diffuse Interstitial Keratitis in Acquired Syphilis.—Carpenter, John T., Philadelphia (Ann. Ophthal., Oct., 1908). In about 7000 cases in private practice the author has seen but two cases of interstitial keratitis from acquired syphilis. Among 12,000 cases at the Eye Dispensary of the Universary Hospital only one case was seen. The onset of this form of the disease is insidious in character, and, without marked ciliary injection, the cornea is found to contain many irregularly outlined, gray, deeply placed, punctuate lesions beginning either in its central portion, or, more rarely in its periphery. These punctuate lesions gradually fuse, and the cornea becomes opaque without much involvement of its surface, or of Descemet's membrane. Following the infiltration, vessels push from the periphery into the parenchyma, but the vascularity is usually less pronounced than in the hereditary form, and lacrimation and photophobia are not prominent symptoms. Under mercurial treatment the cornea completely clears in from five weeks to three months. The three cases of the author are reported at length. M. B.

A Case of Leprous Keratitis (Hyperplastic Type) With Anatomical Examination. Savineau and Morax. (*Annales d'Oculistique*. August, 1908.) The patient had been for a long time affected with various manifestations of leprosy. The tumor was situated in the lower external part of the cornea of the right eye, and occupied more than a third of its extent. It was of oval form and fungus aspect. The central portion had exfoliated and was umbilicated and the margin was raised four m.m. There was a perforation with prolapse of the iris. An intense vascularization with a number of new formed vessels, extended to the conjunctival cul-de-sac.

There was iritis in the left eye.

Microscopical examination of the enucleated right eye showed that there was a thickening of the cornea to twenty times the normal. The sclero-corneal thickening consisted of a vascular cellular infiltration covered by normal corneal epithelium. The tissue presented a fasciculated disposition which gave it the appearance of a fasciculated sarcoma. The separated corneal layers could be recognized in the deeper portions. Examination of the membranes of Descemet and Bowman, with a high power, showed the tumor to be composed of large mononuclear cells crowded with bacilli whose number was so great that their coloration by fuschin made the whole infiltrated region red.

The other tissues of the globe presented comparatively insignificant lesions. G. C. H.

Interstitial Keratitis.—Stephenson, Sidney (*Brit. Med. Journ.*, Oct. 31, 1908), read a paper on this subject before the Section of Diseases of Children, at the last meeting of the British Medical Association. He pointed out that interstitial keratitis was, relatively speaking, not a common affection of the eyes; that the greatest incidence occurred between the ages of 5 and 15 years; that females were more often affected than males, and that syphilis (hereditary or acquired) accounted for about two-thirds of all cases. Experimental evidence went to show that the disease was due to the presence in the parenchyma of the cornea of the casual agent of syphilis. The latency of the disease was to be explained by the diffusion of the organism known to occur in syphilitic babies. The spirochaeta pallida had been found in the seemingly healthy tissues of the eye in specific infants and fœtuses (Bab, Peters, Stock and Stephenson). Interstitial keratitis was little influenced by the administration of species, but Stephenson had found that atoxyl given in conjunction with mercury was a most efficacious remedy. Cases were quoted in which comparatively rapid cure had resulted from these means. The author advocated the intramuscular injection of atoxyl in doses of from 0.25 to 0.50 grams—that is, 3¾ to 7¾ grains—repeated once a week in mild cases, and more frequently in severe ones. Not more than 6 grams should be given in all. A course of twelve injections usually suffice to cure, or almost cure, all cases. (Abstr. Colorado Medicine, Dec., 1908).

H. V. W.

## GENERAL DISEASES AND THE EYE.

Inequality of the Pupils in Progressive Paralysis, and its Diagnostic Value.—Rodiet, A. (*Wiener Klinische*

*Wochenschrift,* Oct. 29, 1908.) Inequality of the pupils is considered an important symptom of the first period of progressive paralysis and makes its appearance before any other symptom of the disease.

Considering this symptom, it is of importance to consider the nature of the light, accommodation, and mobility of the eyeball, because these are all factors that have some influence on the size of the pupils.

Inequality of the pupils is also found in patients suffering from anemia, Basedow's disease, and in cases of painful irritation of sensitive nerves in tuberculosis of the lymph glands, and in aneurysmal dilatations of the aorta.

The main symptom of progressive paralysis is the progressive internal ophthalmoplegia: the muscle of accommodation becomes paralyzed first in one, or in both eyes at once.

The Argyll-Robertson pupil is more frequently to be found in tabes and syphilis of the brain, rather than in progressive paralysis.

Unilateral mydriasis is found in syphilis, and is not always a symptom of a severe affection of the brain; bilateral mydriasis is a symptom of external ophthalmoplegia; it indicates an affection of the nuclei and does not give a favorable prognosis. J. G.

ON TUBERCULOUS PANOPHTHALMITIS SUBSEQUENT TO PUERPERIUM.—KELLERMANN, MAX. (From the eye clinic of Prof. E. Krueckmann in the University of Koenigsberg i. Pr., *Zeitschrift fuer Augenheilkunde,* xx, 1908, p. 464.) The right eye of a woman aged 28 suddenly became inflamed 2 weeks after she had borne her 2nd child. The lids swelled, purulent secretion set in, and V. was rapidly lost. About 2 months later, when she came to the clinic, the conjunctiva was injected and the sclerotic showed, immediately behind the insertions of the superior rectus and external rectus muscles, two perforations of the size of a pea, from which yellowish masses projected. The opaque cornea prevented an ophthalmoscopic examination, and there was no perception of light. The sclerotic of the enucleated eyeball was enormously thickened; between the lamellae was blood pigment, and the perforations were lined with granulation tissue, cornea infiltrated with various leucocytes, anterior chamber filled with fibrin and granulation tissue, iris and ciliary body almost totally converted into a granulating mass, and thickened to four times the original size, lens cataractous. Vitreous, chorioid and retina were also transformed into granulation tissue.

The histological picture was uniform: numerous nodules with typical tubercular giant cells, epitheloid cells, arranged radially, and a peripheral ring of leucocytes. At some places were marked cheesy degenerations and necrosis, but, except in the cornea and sclerotic, an infiltration with leucocytes could nowhere be ascertained, which might be taken for an inflammation produced by pyogenic germs. The condition was so characteristic of tuberculosis that staining of bacilli in the sections was superfluous. The whole contents of the eyeball, excepting the lens, could be considered as a giant conglomerate tubercle which had ruptured the capsule of the globe at two points. The case differed from the three cases from literature, in that no focus was found on the body from which the ocular metastasis had originated. A metastasis had to be assumed from the whole histological condition, and the fact that the corneal surface was intact and traumatism was denied. The two large perforations of the sclerotic, the absence of shrinkage of the eyeball and the necrotic masses with the subjectively mild and relatively tardy course of the disease rendered it improbable that there was an infection by virulent pyogenic germs. K. emphasizes that in future intraocular diseases of similar course and negative general and bacteriological findings a tuberculosis affection ought to be thought of. C. Z.

OCULAR METASTASIS AFTER A FURUNCLE AT THE BACK OF THE NECK.—PAGENSTECHER, ADOLF H., Wiesbaden. (*Zeitschrift fuer Augenheilkunde*. XX., 1908, *p.* 458.) Observed in a woman, aged 51, about 2 weeks after phlegmon of the posterior and lateral portions of the neck, which had been incised early, intense pain in the right orbit, protrusion and lack of mobility of the eyeball, redness and swelling of the lids and, from 2 to 3 days later, hypopyon. The ocular conjunctiva bulged at the temporal side. The patient could not see motions of the hand. The next day a fistula had formed at the lower border of the external rectus, 6 mm. distant from the cornea, from which pus oozed, and there was a yellowish-green reflex from the interior of the eye. A probe, introduced into the fistula, entered directly into the eyeball. Soon the iris showed yellowish discoloration. The affection healed with shrinkage of the posterior segment of the eye and amaurosis. As staphylococci were found in the primary focus at the neck and the metastasis, their connection was out of question.

P. assumed that the first metastasis occurred under the external rectus muscle, or was primarily intrascleral in a small scleral branch of the anterior long ciliary artery, and wandered from these through the thin sclerotic, perhaps along the artery, to the interior of the eyeball. The hypopyon could not very well be caused by this affection, but was most likely due to a direct metastasis in the iris, whence it ruptured into the anterior chamber. Or both foci were thus connected that pus from the interior broke into the vessel, which supplies the larger anterial circle of the iris, as the hypopyon was situated at the entrance of this artery.

From this case and 3 similar ones which are quoted from literature, P. distinguishes 2 different kinds of subconjunctival abscess: a milder type with less irrigation from ectogeneous infection and a severe form complicated by intense inflammation of the eye from metastatic infection, under the clinical aspect of subconjunctival abscess. C. Z.

Bilateral Metastatic Ophthalmia Following Epidemic Cerebro-Spinal Meningitis.—Cosmettatos. (*Annales d'Oculistique,* October, 1908.) Cosmettatos reports a case of this affection. According to Uhthoff, metastatic ophthalmia occurs in four or five per cent. of the cases of cerebro-spinal meningitis. It is usualyl monolateral, but occasionally both eyes are simultaneously affected.

It is generally considered that the purulent metastasis commences nearly always in the retina or chorioid and the uveal tract. Generally there is purulent retinitis with propagation of inflammation to the vitreous and iris. Lesions of the optic nerve or of its sheaths have not often been found.

Meningococci have been found in the blood of patients affected with this metastatic ophthalmia, which tends to show that the metastasis is accomplished through the circulation. Meningococci have been discovered in the interior of the eye only in the commencement of the disease and have disappeared when th vitreous has been examined a little later, which shows that the metastatic ophthalmia is produced by toxines. G. C. H.

The Ocular Manifestations of Epilepsy.—Rodier, Pansier and Cans. (*Annales d'Oculistique,* October, 1908.)

This paper is the result of the examination of the eyes of fifty epileptic patients. The examinations were made before the attack, during the attack, and in the interval. Injection, with hyperesthesia or anesthesia of the conjunctiva, was noted during and for a few minutes after the attacks. The pupil was most frequently dilated.

The mydriasis was generally observed at the commencement of the attack and continued during the convulsion. During the depression following the attack the pupil was normal, or even contracted. In the interval it was slightly dilated. The reflex was abolished during the attack and sluggish afterwards; never more active than normal. After the attack paradoxical reflex and hippus were often met with.

Before the attack the retinal vessels were usually at first anemic, then hyperemic. During the attack, whenever it was possible to make an ophthalmoscopic examination, the papilla was always found congested. Even in simple vertigo there was more or less marked hyperemia, and the congestion was in proportion to the violence of the attack. After the attack the hyperemic persisted for a period varying from a few minutes to two hours. The two retinas were always found unequally congested.

The form of the congestion was characteristic. Usually the papilla and the retina remained pale, but the veins were greatly dilated and sinuous and often pulsated. Sometimes there were superficial hemorrhages. In some cases of long standing, the congestion of the fundus had become permanent, while the papilla was pale.

In nearly all cases a condition of the chorioidal pigment, which suggested hereditary syphilis as a frequent, but often unrecognized, cause of epilepsy, was noted.

An irregular contraction of the visual field, without tendency to the hemianopsic form, was observed in the interval of attacks and became more decided after the attack.

Amblyopia immediately preceding the attack has a value as a prodrome. Persisting after the attack it is a symptom of post-paroxysmal exhaustion. It is often accompanied by hallucinations. The degree of amblyopia after the attack is in proportion to the intensity of the crisis. A patient with $V = 1$ before the attack may have $V = 4/v$ after a slight one, or

V = 1/vi after a severe one. The amblyopia is in relation with the degree of hyperemia of the fundus.

Other visual troubles are observed in connection with epilepsy which are dependent upon the mental state rather than upon the ocular conditions—such as colored vision, aberrations, illusions and hallucinations of vision, which are accompanied by delirium, often very active and sometimes persisting during the interval of the attacks. G. C. H.

AN EPIDEMIC OF INFLUENZA CHARACTERIZED BY EDEMA OF THE EYELIDS.—SPRIGGS, N. L., Castlefields, Eng. (*Brit. Med. Jour.*, Dec. 12, 1908.) The writer gives short histories of ten instances of this sort in which there was edema of the eyelids, generally associated with bad frontal headaches, occurring as an early symptom of influenza, sometimes followed or accompanied by pyrexia and other general symptoms; in other cases without such symptoms. The usual history in a series of 40 cases was as follows: The patient goes to bed well, but wakes with marked edema. There is no redness, or at most a faint pinkish tinge. At this stage there are no general symptoms. During the next twenty-four hours a bad headache develops, strictly localized to the supraorbital region. The edema advanced till the eyes are completely closed, and may spread downwards into the cheeks. In at least half the cases there is deep congestion, often accompanied by edema of the conjunctiva, but there is no discharge. The temperature never rises about 101°. In more than half the cases the above symptoms constitute all the illness; but in a fair proportion, perhaps nearly half, after a few days, as the edema recedes the ordinary symptoms of influenza set in, and there are pains in the back, legs, etc., and great prostration. The urine is normal.

The great majority of cases occurred in poor patients; there was a large preponderance of females. There is little doubt on the influenzal origin of the edema. The prognosis appears to be excellent. The usual lines of treatment for influenza should be followed; cold compresses or cold boric eyewashes appear to hasten the subsidence of the edema. C. H. M.

ON INFECTIONS OF THE VISUAL ORGAN FROM INFLUENZA.—ROSENBACH, EDMUND (From the eye clinic of Prof. Wicherkiewicz and the microbiological institute of Prof. Novak in the University of Krakau, *Klinische Monatsblaetter fuer Augen-*

*heilkunde*, xlvi, 2, 1908, p. 366), gives the clinical histories of six cases. Three of them were cases of conjunctivitis, caused by influenza bacilli, two occurred in infants in the first few weeks of life, one in a child aged 3 months. The inflammation was acute, subacute with profuse purulent secretion in the older child. It was limited to the palpebral conjunctiva and the retrotarsal folds and without corneal complications. The anamnesis revealed no preceding affections of the respiratory tract or the hearing organ, showing that the conjunctivitis was primary, which has also been observed by zur Nedden in 1903.

Although there were no secondary complications of inner organs, influenza conjunctivitis must be considered as a serious affection which requires energetic treatment. The inflammation generally lasts from 10 days to a fortnight. Nitrate of silver in from 1 to 2% solutions, xeroform and yellow ointment yielded good results.

A subconjunctival abscess, extending from the sclero-corneal junction to the equator, in the fourth case, was probably metastatic or caused by conveyance of influenza bacilli wtih the fingers from the mouth. It healed after incision.

In the fifth case a dendritic keratitis was mostly likely secondary, and the sixth case presented a retrobulbar abscess in the course of influenza, following purulent inflammation of the frontal sinus.

All cases demonstrate that the influenza bacillus is not as innocent for the visual organ as at first supposed. In the final chapter on bacteriological examinations, R. states that the best culture soil for the influenza bacillus is blood agar. The presence of staphylococci in the cultures promotes the growth of influenza bacilli. In his cases staphylococcus albus was found with the influenza bacillus as a harmless associate. With regard to literature the author refers to Axenfeld's *Bacteriology in Ophthalmology*. C. Z.

Indurated Chancre of the Inferior Cul-de-Sac of the Conjunctiva in a Child of Five Years.—Angelis. (*La Clinique Ophtalmologique*, 25 September, 1908.) Angelis reports the case on account of its rarity; as to how the chancre was acquired he was unable to discover. The usual systemic lesions followed, but were controlled, and successfully treated by intramuscular injections of cyanide of mercury. B. E. F.

Eye Symptoms in Myxedema.—Demets. (*Wiener Klinische Wochenschrift,* September 24, 1908.) There are numerous affections of the eye in close relation to hypothyroidismus.

Among the congenital affections in such relation are included anophthalmia, kryptophthalmia, coloboma of the iris, aniridia, coloboma of the chorioidea, congenital myopia, retinitis pigmentosa, congenital strabismus, zonular cataract and albinismus.

The affections due to these conditions, appearing during adolescence, are: Keratitis interstitialis, neuroretinitis( iridochoriodidtis, hemorrhages of the retina and kerato-conjunctivitis of the phlyctenular type.

In most of these cases adenoid vegetations are to be found in the naso-pharynx.

As a sequel to hypothyreoidismus in adults, we find arteriosclerosis, hemeralopia, atrophy of the optic nerve and senile cataract.

The good results following the treatment with thyroid extract show the close relationship this condition bears to affections of the eye. J. G.

The Ocular Lesions in Paget's Disease.—Vergne. (*Annales d'Oculistique,* November, 1908.) Vergne reports three cases of this disease in which there were lesions of the chorioid and retina strongly resembling those of specific chorio-retinitis. As no symptoms of acquired syphilis were found in any of the patients, it is a question of hereditary syphilis, which, the author thinks, furnishes the most satisfactory explanation of the ocular and bony lesions.

## GLAUCOMA.

Anatomical Factors in the Pathogenesis of Glaucoma.—Henderson, Thompson, Nottingham, Eng. (*Ophthalmoscope,* October, 1908.) The author's summary is as follows:

1. The globe formed by the corneo-sclera is analogous to a rigid case, because its internal capacity is strictly limited and cannot be increased.
2. The intra-ocular pressure, like the intra-cranial, is purely circulatory in origin and represents the capillary venous pressure within the eye, and for anatomical reasons, more particularly the venous pressure within Schlemm's canal.
3. The iris owes its absorptive power to Fuchs' iris crypts, which allow the aqueous direct access to the iris veins.

4. Serial sections show that the venous sinus of Schlemm's canal is formed by tributaries from the whole anterior portion of the uveal tract. The venous pressure in the sinus is thus the lowest with which the aqueous comes into direct contact, and absorption taking place only at the same hydrostatic level accounts for Schlemm's canal being the main aqueous outlet.

5. Whenever the hydrostatic pressure of the aqueous rises above that within Schlemm's canal it causes pressure on the sinus walls and the blood-pressure will mount. As soon as the blood-pressure within Schlemm's canal equals that within the iris veins, the latter are put on an equality with the former and the aqueous will drain away as well through the iris crypts and veins as though the cribiform ligament and Schlemm's canal. The resulting increased outflow reduces the hydrostatic pressure on the aqueous on the sinus, so that its blood pressure again falls below that of the iris veins.

6. Under physiological conditions, on account of the complete measure and extensive range of compensatory outflow via its iris crypts and veins which follows any increase in volume of the vascular contents of the eye, variations in intra-vascular pressure cannot be transmitted to the intra-ocular contents (vitreous and aqueous) so as to cause a permanent rise in tension.

7. Physiological sclerosis of the cribiform ligament diminishes the aqueous outflow through Schlemm's canal and throws a greater proportion of the work of drainage on the iris crypts and veins.

8. If the iris crypts are not equal to the work, tension slowly and imperceptibly rises, non-congestive glaucoma.

9. The intra-ocular fluids (vitreous and aqueous) transmit pressure equally in all directions, and therefore when their exit is diminished and tension rises, vessels are compressed and the pressure within them, and also without them, rises, so that the whole elastic vascular system within the eye tends to be converted into a system of rigid tubes.

10. Hindrance to the ready access of aqueous to Schlemm's canal cannot be the cause of the deepening of the anterior chamber in "serous" cyclitis or "simple" glaucoma, as with a free and open pupil the pressure in the anterior chamber cannot rise above that in the posterior aqueous chamber into which the aqueous is first secreted.

11. In pathological as in physiological states of intra-ocular tension, there is no pressure discontinuity within the globe of the eye.

12. In an eye with tendency to glaucoma, i. e., with sclerosed cribriform ligament and therefore diminished range of outflow, a congestive glaucomatous onset will be precipitated by:

(a) Dilation of the pupil, resulting in closure of the iris crypts and abolition of the only remaining aqueous outlet.

(b) Arterial rise of pressure. The aqueous is an escape valve which allows more arterial blood to come into the eye. If the aqueous cannot escape then on rise of arterial pressure veins are compressed and a vicious circle started.

(c) Rise in venous pressure. Venous congestion implies not only an increased volume of venous blood in the eye, but diminished absorption already reduced to a minimum.

13. The difference between chronic non-congestive and acute glaucoma is one of degree and not of kind.

14. With the rise in intra-ocular tension the whole of the uveal tract participates equally in the resulting congestion and edema.

15. The amount and extent of the occlusion of the angle of the anterior chamber depends directnly on congestive edema of the iris, causing its base to become applied and then adherent to the posterior surface of the cornea. Once started, this process automatically increases with each congestive attack.

16. The forward displacement of the ciliary processes, whether congested or atrophied, is not the cause but the effect of the adhesion of the iris to the posterior surface of the cornea.

17. The marked shallowing of the anterior chamber is another manifestitation of the acute congestive edema of the uvea, and results from swelling of the orbiculus ciliaris, causing slackening of the zonular fibres and so allowing the lens to come forward.

18. Treatment does not affect the route to Schlemm's canal, already made impassable, but depends altogether on the iris for its success. The greater the disorganization of the iris the less treatment avails.

19. Myotics are only beneficial in proportion as they open out the existing iris crypts.

20. The success of iridectomy depends on the direct path

it makes for the aqueous to come into direct contact with the iris veins. The base and pillars of the coloboma form a large crypt occupying, as it were, three sides of a square, since the cut surfaces of the healthy iris do not cicatrise. M. B.

CONTRIBUTIONS TO THE PATHOLOGIC ANATOMY AND PATHOGENESIS OF GLAUCOMA.—LEVINSOHN, GEO., Berlin (*Archiv fuer Augenheilkunde*, lxii, 1908, p. 131). The failure to definitely ascertain the primary cause of glaucoma in spite of numerous anatomic examinations of glaucomatous eyes was chiefly due to the fact that these eyes were not available for autopsy until a very long time after the outbreak of glaucoma. But the vulnerability of the visual organ is so great, that it is impossible to detect with any certainty in such degenerated eyes the primary changes leading to the glaucomatous attack. L. was fortunate enough to examine both eyes affected with chronic inflammatory glaucoma, of a senile lunatic, who died a few weeks after admission, with the following result: In glaucoma pigment infiltration of the pectinate ligament, respectively of the anterior peripheral synechia is found very frequently, perhaps regularly. The pigment, i. e., the pigment epithelium or its contents, is not hematogenous but originates from the pigment epithelium of iris and ciliary processes. It always elicits an accumulation of leucocytes which imbibe the pigment particles and carry them partly into circulation, partly into the anterior surface of the iris. Therefore the region of the pectinate ligament and of Schlemm's canal loses in pigment the longer the glaucomatous condition exists. The pigment always comes from the most ciliary portions of the iris and the anterior ciliary processes. It is very resistant to pressure, and remains intact even in old cases with atrophic iris, except at the ciliary portion.

There must be special causes for the alteration of the pigment epithelium, which L. sees in the hypertrophy of the connective tissue of Müller's muscle and the ciliary processes. This hypertrophy damages the adjacent pigment epithelium by its trophic influence and mechanically by pressing the ciliary processes on the posterior surface of the iris. The hypertrophy produces a dislocation of the sagittal edge of the ciliary body and the root of the iris, so that the anterior chamber is narrowed and a disposition to glaucoma is given. The increased pressure destroys the smooth muscular fibres, with diminution of the ciliary body, especially the sphincter of the iris and Müller's muscle, while Brücke's muscle remains intact even in the oldest cases. The dilator of the pupil, like the pigment epithelium of the iris, is especially resistant, it even seems as if it became hypertrophic through longer persistence of increased pressure. This explains the intense mydriasis in absolute glaucoma which in equal atrophy of sphincter and dilator would be of medium degree.

The hypertrophy of Müller's muscle corresponds with the general hypertrophy of smooth muscular fibres in old age (myomatosis, hypertrophy of the prostatic gland), and with the fact that glaucoma predominantly occurs in hypermetropic eyes in which Müller's muscle is very markedly developed or hypertrophic. The clinical symptoms at the prodromal stage indicate a disturbance in the ciliary body (decrease of accommodation, fine deposits on Descemet's membrane). The intense clinical signs of an attack of acute glaucoma (stagnation of fluid, hyperemia, sensitiveness to pressure, great pain) are best explained by a sudden hindrance of the current of the intra-ocular fluids.

Glaucoma presents an analogue to renal or gall stone colic. Not only primary but also secondary glaucoma very frequently is due to an obstruction of Fontana's spaces, as in serous iritis, swelling of the lens, after discission of secondary cataract, plastic iridocyclitis, dislocation of lens and intraocular tumors. Anatomical researches showed the obstruction to be caused by infiltration with swollen particles of the lens, vitreous substance, pus corpuscles, fibrin and the freed contents of damaged pigment epithelia. It is very probable that also other causes than the infiltration of Fontana's spaces may create glaucoma.

L. attempted to produce glaucoma in cats and rabbits by injecting pigment epithelium, scraped from the posterior surface of the iris of one eye and triturated in aqueous, into the anterior chamber of the other eye, but with negative results. His anatomical findings in the glaucomatous eyes are illustrated on plates. C. Z.

On Glaucoma in Albuminuric Ocular Affections.—Tschirkowsky, W., Kasan (From the eye clinic of Prof. Th. Axenfeld in the University of Freiburg, i. Br. *Klinische Monatsblaetter fuer Augenheilkunde,* xlxi, 11, 1909, p. 272), gives a brief review of the so far published anatomo-pathological investigations on glaucoma in albuminuric retinitis, in which the chief stress was laid on the extensive inflammatory and degenerative alterations of the retinal and chorioidal vessels, and of the 4 anatomical descriptions of glaucoma in albuminuric detachment of the retina extant. Then the clinical histories and anatomical examinations of 2 cases, observed at the clinic, are reported.

The first occurred in a girl, aged 21, who had chronic nephritis and albuminuric retinitis of both eyes with a large hemorrhagic detachment of the right retina. This was due, as the histologic examination revealed, to a hemorrhage from diseased chorioidal vessels and thrombosis of a posterior vortex vein which emerged from the sclerotic near the disc.

In the 2nd case, a man, aged 25, who had albuminuric retinitis with the aspect of thrombosis of the central retinal vein, an inflammatory glaucoma set in in the right eye, which finally was enucleated. At the anatomical examination periphlebitis and mesophlebitis of the central vein, but no thrombosis, were found. The glaucoma most likely was caused by increase of the volume of the vitreous, perhaps edema.

In summarizing, T. distinguishes 3 principal groups of diseases in which albuminuric glaucoma may occur: 1. Glaucoma in ordinary albuminuric retinitis. 2. In detachment of the albuminuric retina or the rare hemorrhagic detachment. 3. In thrombotic diseases of the central retinal vessels in consequence of albuminuria.

In all 3 groups the anatomo-pathological, substratum consists in an affection of the blood vessels, in the first, comprising the whole vascular system of the retina, in the 2nd group, of detachment, the vessels of the chorioid, especially the vortex veins, and in the 3rd the stem of the central retinal vein.

C. Z.

On Peripheral Iridectomy in Glaucoma.—Woelfflin, E., Basel (*Klinische Monatsblaetter fuer Augenheilkunde*, xlvi, 11, 1908, p. 534). W.'s method consists in forming a broad peripheral coloboma of the iris without cutting the sphincter. He considers this preferable to the usual iridectomy for the following reasons: A better visual and cosmetic effect, better action of miotics which must be continued for quite a while even after regularly performed iridectomies in order to insure a more lasting result of the operation, and for a better readjustment of both sides of the coloboma. The modification proved very successful in 3 cases. Double vision through the double pupil was not observed, as the coloboma was covered by the upper lid. It would occur only if the retina does not fixate the object. Pflüger and Snellen were also in favor of preserving the sphincter iridis. A definite opinion as to the value of this modification of iridectomy in glaucoma will only be possible after more numerous observations extended over a number of years. C. Z.

IODATE OF SODA AND SECONDARY GLAUCOMA.—DARIER (*La Clinique Ophthalmologique,* July 10, 1908.) Schiéle has extolled iodate of soda in subconjunctival injections for its analgesic and resolvent qualities. In iritis and glaucoma it should produce a marked removal of the pain and a diminution of the hypertension. Its effect upon rheumatic, syphilitic and tubercular affections is very remarkable, and Darier states he can confirm this from personal observations. In one of Darier's cases of chronic iridocyclitis with complete occlusion of the pupil which had resisted other forms of treatment, he injected subconjunctivally, 0.001 gr. of the iodate of soda. The iris was ballooned forwards and an iridectomy impossible. Darier made two injections. After the second there was marked improvement and an iridectomy was easily done.

Darier reports eleven cases in which the iodate of soda was subconjunctivally injected with marked improvement.

B. E. F.

PAIN OF ACUTE GLAUCOMA RELIEVED BY COCAIN APPLIED TO MECKEL'S GANGLION.—EWING, A. E., St. Louis, Mo. (*Amer. Journ. Ophth.,* Dec., 1908). The writer reports a case in which the local application of cocain to Meckel's ganglion relieved the pain of acute glaucoma; he was led to try this method through the report of Dr. Greenfield Scudder, who had relieved or cured a number of cases of obscure headache by this procedure; the anesthetic, one drop of a 5 per cent. solution of cocain, was carried by a very small amount of cotton on the end of an applicator and applied just posterior to the posterior tip of the middle turbinate of the affected side. Within a few minutes the pain in the eye and temple ceased entirely. A pilocarpine 0.5 per cent. oil solution was prescribed to be used every four hours; the next morning there was decided improvement in all the symptoms of the glaucomatous attack. Nine days later the globe was quiet. The cocain was applied only the one time. C. H. M.

GLAUCOMA IN CONSEQUENCE OF CICATRIX OF THE CORNEA WITH ANTERIOR SYNECHIA (LEUCOMA ADHERENS).—FUCHS, ERNST, Vienna (*Ophthalmoscope,* Oct., 1908). At the time of the ulcer perforating the cornea the iris and cornea come together, and may become adherent throughout more or less of their extent. There may be a ring-shaped space near the iris root, or as is usually the case adhesion is complete from the root of the iris to the margin of Descemet's membrane. As the anterior chamber reforms, the action of the sphincter pupillae tends to separate the iris from the cornea and will generally succeed in detaching the iris up to the angle. But when the synechia involves the sphincter it is rendered inactive in part or as a whole. In these cases the angle of the anterior chamber is obliterated not only at a point corresponding to the site of the synechia, but throughout the whole of the circumference. The point the author makes is that notwithstanding this, the tension is not raised. Two explanations are given. One is that the peripheral adhesions do not effectually exist all around; the other is that the peripheral synechia does not impede the elimination of the aqueous humor, the reason being that the iris tissue, by means of the crypts which bring the aqueous in direct contact with the ligamentum, is in open communication with the aqueous chamber. M. B.

A NOTE ON THE SEASONAL PREVALENCE OF ACUTE GLAUCOMA.—MAYNARD, F. P., Calcutta, India (*Ophthalmoscope,* Nov., 1908). The only seasonal factor which may have some influence appears to be the amount of light. After months of brilliant sunshine, the third week of June ushers in cloudy weather, which lasts until October or November. This change in the amount of sunlight is very striking and may possibly, by lessened contraction of the pupil, bring on an attack of glaucoma in those predisposed to it. M. B.

ANATOMICAL EXAMINATION OF A GLAUCOMATOUS EYE OPERATED UPON BY IRIDO-SCLEROTOMY.—DEMICHERI (*Annales d'Oculistique,* Sept., 1908). In the case of a patient operated upon by the method of Lagrange, the continuance of severe pain necessitated enucleation fifteen days later and a microscopical examination was made by Demicheri.

He found that the bevelled posterior edge of the incised sclerotic was enclosed by the little root of the iris by the iridectomy. The anterior edge of the cicatrix was rounded and its fibres somewhat separated. Between the two edges of the sclerotic wound there was a little plug of atrophied iris, and beyond the iris a layer of connective tissue.

The cystoid cicatrix was formed of vascularized and edematous connective tissue and contained numerous pigment cells which seemed to have been washed there by a current, being arranged in a line from the iris to the center of the cystoid cicatrix.

Study of this region left no doubt that there had been a true filtration of aqueous humor from the anterior chamber to the subconjunctival tissue.

Though the scleral incision had been very peripheric, there was no sign of a communication between the anterior chamber and the subchorioid space. Towards the angles of the incision there was an incarceration of the iris which occupied half of the thickness of the sclerotic and completely closed the cicatrix. At these places there was no connective tissue separating the edges of the wound and no marked cystoid character of the cicatrix. There had been no filtration where the sclera had not been excised.

The subconjunctival epithelium, which covered the cicatrix, was normal. G. C. H.

HYDROPHTHALMUS.—RUMSZEWICZ K. (*Postep Okulistyczny* Nos. 4 and 5, 1908). The author's conclusions as to the Nature, Pathology and Treatment of Hydrophthalmus are as follows:

1. Persistence of the embryonal ligmentum pectinatum.
2. Abnormal development of the canal of Schlemm.
3. Closure or narrowing of Schlemm's canal.
4. Thickening of the trabeculae in the spaces of Fontana.
5. Rudimentary development of bloodvessels in the anterior portion of the sclera.

The author recommends iridectomy as the only operative procedure, as it causes a filtrating cicatrix.,

K. W. M. Translated by H. V. W.

## INJURIES.

A Case of Bluish Discoloration of the Conjunctiva from an Indelible Pencil.—Brav, Aaron, Philadelphia (*N. Y. Med. Jour.*, Jan. 2, 1909). The writer gives the history of an instance of this sort in which the conjunctiva of the lower lid as well as that of the bulbar conjunctiva up to the lower sclerocorneal margin was of a dark purple color. This change in color had been produced by injury of the conjunctiva with a piece of the lead of an indelible pencil, the pigment having been spread by rubbing with the finger. The discoloration disappeared completely in eight hours, nothing having been applied except an alkaline wash. C. H. M.

The Condition Prior to Accidents Among the Laboring Classes and Especially Ocular Injuries.—Bettremiux (*La Clinique Ophtalmologique* 10 and 25, Aug., 1908). Commentators on the law of accidents generally admit that it is not possible to determine the condition of the subject prior to an accident when one has to fix the indemnity due to the injury. The author goes over the ground thoroughly and shows that many conditions existing previous to the injury might increase the defect and which yet without the injury these conditions would not, might not, be a factor to a decreased earning capacity of the individual. B. E. F.

Ring-Shaped Opacity of the Anterior Surface of the Lens and Papillitis After Contusion.—Loehlein, Walter (From the eye clinic of Prof. Roemer in the University of Greifswald, *Zeitschrift fuer Augenheilkunde*, xx, 1908, p. 364). The left eye of a man, aged 28, was struck by a piece of iron 2 cm long and 1 cm wide. At the examination 3 days later, the cornea was hazy and the anterior surface of the lens showed a ring-shaped opacity of the diameter of the pupil. Under the corneal microscope the opaque ring consisted of dots and lines in radial arrangement, and the center was also slightly opaque from yellowish brown deposits. On account of opacities of the vitreous the fundus appeared indistinct. V=0.2. After 2 weeks the ring-shaped opacity had completely subsided. There was also a papillitis, which undoubtedly was of chemical or toxic origin, as there was no perforation nor signs of infection in the anterior segment of the globe. About 6 weeks after the accident the borders of the disc were not yet entirely distinct, but V was normal and visual field almost normal.

Vossius attributes this phenomenon to the impression of the pupillary margin on the anterior surface of the lens in contusions from in front, in which one must suppose that the cornea is driven inwards. In his experiments on rabbits and cats with hammer-shaped instruments, L. could not obtain an opaque or pigmented ring, only the well-known irregular uniformly saturated opacities of the anterior surface of the lens. The deposits of pigment are most likely due to individual disposition, perhaps pre-existing degeneration of the pigment epithelium. C. Z.

AN HISTOLOGICALLY EXAMINED CASE OF EVULSIO NERVI OPTICI WITH LUXATION OF THE BULB.—REIS, W. (*Postep Okulistyczny* No. 1, 1908). According to Salzman, Evulsio nervi optici consists of a tearing away of the optic nerve from the lamina cribrosa, without rupture or evulsion of the globe. A rupture of the optic nerve occurs but seldom following orbital injuries. The author describes a case of a 37 year old man in whom the left eye, following a blow from a hoof, had been forced out of the orbit and hung by only its blood vessels and attachments (Luxatio Bulbi Completa vel Avulsio Bulbi). The globe being cut off, was histologically examined. Hemorrhage into the vitreous, retinal detachment and laceration of the nerve in the region of the lamina cribrosa was found. The sheaths of the nerve were not torn away from the sclera and formed a pouch 28 min. long.

This contained vitreous and blood clots.

K. W. M. Translated by H. V. W.

TRAUMATIC INJURIES TO THE EYE.—KIPP, CHAS. J., Newark, N. J. (*Journal of the Medical Society of New Jersey*, Feb., 1909). He describes a series of four cases in detail.

I. Perforating wound of sclerotic and ciliary body; complete recovery. This injury was due to a pin sticking the lower lid of the left eye. Patient treated herself with boric acid for one day; eye was blood-shot when she consulted him the next day; only visible injury he saw, swollen lid and injected conjunctiva; next day considerable pain, bulbar conjunctiva very much congested, hazy cornea, cloudy aqueous and hypopion (small) iris swollen and discolored. Using leeches to temple, sulphate of atropin and dionin powder in conjunctival sac, and at home cocain hydrochlorate 2% sol. acid, 1% atropia sulphate; internally sod. salicylate grs. 10 every four hours. Ten days later used mercury and chalk in the place of sod. salicylate. Descemet's layer covered with fine particles pyramid shape and vitreous opacities; dionin discontinued. Seven weeks' treatment gave the patient normal vision.

II. Girl 12 years old, while shaking a carpet, felt something strike her eye. Case seen 16 hours after injuring ocular conjunctiva infected and edematous, cornea hazy and one small abrasion aqueous turbid, iris discolored, and adherent at one point to lens capsule. Lens hazy and a star-shaped opacity on the posterior surface. Vitreous cloudy, unable to see the fundus V = fingers at a few feet; leeches to temple, iced compresses, sod. salicylate int. and sulphate of atropine 1%. Under this treatment the case went on to panophthalmitis.

Case III. Male 60 years old, left eye struck by stone V=6/xii, lid odematous. Could not find wound of lids or eyeball, lens clear but vitreous opacities. Retina transparent except at outer lower part, which had a large extravasation of blood. There was an indistinct long rent in chorioid, 1% atropine, Turkish baths twice a week, potassium iodide gr. 10 three times a day was the treatment. Recovery of vision to 4/v. The sclerotic was not ruptured. The author believes this a case of indirect rupture, which are extremely rare.

Case IV. Male, age 20, struck by a stick in the right eye, three days before boric acid had been used before the case came to him. Vision of left eye = 20/xv. Right eye was as follows: Upper lid cut through its free margin near its middle, cornea intact. Ocular conjunctiva and sclerotic (outer half) cut through, exposing the ciliary body and the chorioid. Wound was horizontal and extended limbus as far posteriorly as sclerotic was visible. Blood filled anterior chamber. Vision was light perception only. The conjunctival wound was united by two stitches, cold applications atropine 1%. In two weeks blood absorbed and vitreous opacities were seen which were present ten weeks later. Patient not seen again for five years, when vision was 6/xviii with = 1.5 d. cyl. ax. 30°.

A. M. MacW.

Injuries to the Eye and Adnexa.—Würdemann, H. V., Seattle, Wash. (*Northwest Medicine,* Feb., 1909). Following his other writings the author refers to the rule of Magnus that loss of 50% of normal acuity in the lower class of trades and 20% in the higher causes loss of earning ability and should be the principal ground upon which indemnity should be granted. Insurance companies pay 15 to 30% for the loss of sight in one eye and total indemnity for both. 18 to 30% is the result of mathematical calculation for one eye, the amount allowed by indemnity laws of Germany and other European countries and the average amount of prospective loss allowed empirically by American courts.

Prophylaxis of accidents in trades and a lessening of the number of cases has been afforded by obeying of laws passed requiring safety appliances, screens, protectors, etc. Bacteriologic examination of tools used in trades and of instruments used by workmen to remove motes proves in most cases to be negative. Cuts are given illustrating occupations in which accidents to the eye are common. (Article continued in next issue. A. M. MacW.

## INSTRUMENTS AND METHODS.

The Presentation of a New Eye Dressing.—Hiers, J. L., Savannah, Ga. (*Ophthalmic Record,* Nov., 1908). The dressing consists of twelve layers of surgical gauze passed through a tubular form of gauze mesh to hold them in position, and then cut in sizes 2 ¼ x 3 inches for adults, and a smaller size for children. The pads come packed in small aseptic and hermetically sealed containers. This dressing is held over the eye by strips of adhesive plaster. M. B.

A New Portable Corneal Microscope.—Buchanan, Leslie, Glasgow (*Ophthalmoscope,* Dec., 1908). The instrument is a binocular tube, fitted with a Brücke's lens, and adjusted to a head-band. It gives a magnification of about 3 diameters. M. B.

The Construction, Technique, and Theory of Remy's Diploscope.—Evans, J. J., Birmingham (*Ophthalmoscope,* Dec., 1908). This instrument is used for the demonstration of peculiarities of vision, such as diplopia, suppression, etc., for the exposure of simulation in medico-legal and other cases; for the demonstration and measurement of axial deviations;

for the orthoptic treatment of squint, and for control in the choice of glasses for ocular deviations. The description of the construction of the instrument does not lend itself well to review. M. B.

A NEW FORM OF SCOTOMETER.—BARDSLEY, P. C., London (*Ophth. Review,* Nov., 1908). The purpose of this instrument is the detection of very small losses of visual function, especially in the more central parts of the field. The patient gazes into the dull blacked section of a hollow sphere—a miniature Bjerrum's screen—with a central fixation disc. The surgeon sits behind the sphere and is hidden from the patient. There is nothing moving except the test object, no carrier to reflect the light or to make a noise, nothing to distract the patient's attention. In the fixation spot there is a minute hole; through this the surgeon can watch the eye of the patient continuously, and can immediately detect the slightest deviation on the patient's part. It is hoped that this instrument will show with more ease and accuracy than heretofore: (a) The island and ring scotomata of chronic glaucoma, retinitis pigmentosa, etc. (b) The central scotomata, for colors and for white, of disseminated sclerosis, retrobulbar neuritis and toxic amblyopia. (c) Also, in expert hands, earlier changes than are at present detectable in the function of the retina in tabes, insular sclerosis, and other diseases. C. H. M.

MODIFICATION OF THE DECIMAL OPTOMETRIC CHART PRESENTED AT THE INTERNATIONAL CONGRESS OF MADRID OF 1903.—PERSAS, and remarks on the above by SULZER, DR. E. (*Annales d'Oculistique*, Oct., 1908). The authors advocate the unit of the centigrade degree—the one hundredth part of the quarter circle—proposed by Sulzer.

These articles, with diagrams and tables, do not well lend themselves to abstracting. G. C. H.

A BI-MANUAL OPHTHALMOSCOPE.—TANNER, HERBERT (*Ophthalmoscope*, Nov., 1908). The instrument has two handles, one above and one below. The upper handle, with the instrument in position before the patient's right eye, terminates in a hook, which is placed over the ring finger of the left hand of the operator, whose little finger rests upon the patient's forehead. The right hand of the operator grasps the lower handle. The lenses are turned by the thumb of the left hand. When the left eye is under examination the position of the operator's hands on the instrument is reversed.

M. B.

A Simple Lens Holder for Focal Illumination.—Kehr, Ingolstadt (*Die Ophth. Kl.*, Nov. 5, 1908), has devised a contrivance by which a condensing lens with two ball and socket joints is affixed to a metal spring which is engaged upon the palm of the hand just below the phalanges. This gives absolute freedom to the fingers and thumb, which may be used to separate the lids. It is especially useful in slight corneal operations or for the indirect method. It is made by Fronhaser, München. W. Z.

A Suspended Mounting for the Mellinger Magnet.—Wirtz, Mülenheim-Ruhr (*Wochensch. f. Therap. u. Hyg. d. Aug.*, Dec. 10, 1908), describes a mounting for this solenoid magnet whereby elevation, lowering, lateral movements and rotation on its horizontal axis is obtained. The advantages of this mounting are that the patient lies in the best position for the opening of the anterior chamber, and that no hand magnet is required, as the instruments used become highly magnetic and take its place. A third advantage is that where minute magnetic bodies have entered the eye the ring magnet exerts an enormous traction upon it and does not necessitate the entrance of a hand magnet into the eye. W. Z.

Practical Experiences With the Interior Pole Magnet.—Schirmer, O., Strassburg (*Zeitschrift fuer Augenheilkunde,* xx, 1908, p. 546), compares his experiences with Schloesser's, Volkmann's and the interior pole magnet. As shown by iron filings, the lines of force in the center of the solenoid, represented by the interior pole magnet, always retain a direction perpendicular to the plane of the ring, no matter which angle the iron rod forms with it. This is a great fault of the instrument. If, e. g., a piece of iron is lodged at the lower equator and a traction from above downward is required, this is impossible. The eye must be placed in such a position that the direction between foreign body and anterior chamber is horizontal. This cannot be attained in very peripherally located pieces by simply turning the eye down, and the ring prevents a turning of the head.

Another drawback is that its maximal power is limited to the center of the ring. Its maximal force is extraordinary and may be even too strong, as experienced in a case, in which the foreign body was pulled from the background through the intact lens.

S. had also quite a number of good results with the interior pole magnet, but thinks that its theoretical advantages are more than compensated by these practical disadvantages. S. prefers Volkmann's magnet which allows operating on the patient in a recumbent position on the operating table. C. Z.

A NOVEL UTILIZATION OF ELECTROMAGNETISM FOR THE REMOVAL OF PIECES OF IRON FROM THE INTERIOR OF THE EYE.—MELLINGER, CARL, Basel (*Beitraege zur Physiologie u. Pathologie,* by Otto Weiss. Stuttgart. Ferdinand Enke. 1908). After a brief historical review on the utilization of magnetism in surgery and ophthalmology, M. shows that the various giant magnets have the disadvantage that only a small portion of the lines of force diverging from the poles reach the foreign body. This may be demonstrated by iron filings, strewn on a card and placed on one pole, which form a tuft composd of intensely diverging bundles. M. therefore devised in conjunction with the electrician Klingelfuss a novel form of electromagnet. It consists of a ring whose opening corresponds to the average size of a human head, and is composed of a great number of coils of copper wire, and for obtaining still greater force, is surrounded by an iron mantle. If a solenoid, as a thus constructed ring is called, is pervaded by an electric current a homogeneous magnetic field is created in its interior, with the greatest density in about the middle point of its axis. The rays here accumulated are parallel to the axis. An iron rod held in the center of the solenoid becomes magnetic and filings brought on its end form a bundle of closely crowded threads parallel to the axis of the solenoid, representing the magnetic lines of force. The head of the patient is brought into the ring with the eye in the center, so that the piece of iron in the interior of the eye becomes a saturated electromagnet in the midst of the magnetic field. An iron rod, of which different sizes are at command, is held by the operator in front of the eye and becomes also a saturated electromagnet and attracts the foreign body. M. called his instrument interior pole magnet, which in comparative experiments proved to be superior to the giant magnet. Its practical usefulness was proved in many cases at M.'s clinic.

A brief synopsis of the last 36 cases is given. In all positive results were obtained. The weights of the foreign bodies and their localization in the eye showed that the depth to which a foreign body enters the eye is proportional to its weight, i. e., the greater its mass, at a given velocity, the greater its momentum and the further it will penetrate. This is in concordance with the experimental investigations of Th. Kocher on the action of projectiles. The hydrodynamic influence is slight on account of the minute displacement of space by small pieces of iron. Only very large pieces frequently produce unproportionately large wounds of entrance, so that the hydraulic pressure may not be entirely without influence. Photogravures illustrate the magnet and M.'s method of its employment. C. Z.

ON AN AMBLYOSCOPE WITH ALTERNATING ILLUMINATION. —KRUSIUS, F. (From the eye clinic of Prof. L. Bach in the University of Marburg, *Archiv fuer Augenheilkunde,* lxll, p. 75). The new features of this modified amblyoscope in comparison with that of Worth consist, first, in an alternating illumination, by electric lamps within the instrument, of either of the half images with adjustable velocity of the light changes; second, in several ball and socket joints of the main parts of the apparatus for different kinds and degrees of strabismus and distances between the eyes, as shown by 2 illustrations. C. Z.

SOME REMARKS ON THE PRACTICAL VALUE OF THE SPHYGMOMANOMETER TO THE OPHTHALMOLOGIST.—DUNN, JOHN, Richmond (*Arch. Ophthal.,* Nov., 1908, xxxvii, 687), shows the practical importance of the sphygmomanometer in the examination of many classes of ocular disease. He cites five cases of glaucoma in which he points out the value of the pulse tension as a therapeutic indication, and adds "in every case of essential glaucoma, except those hereditary ones occuring in early youth, which I have examined since the use of the sphygmomanometer has been a part of the routine examination of such cases, the pulse tension was above normal and in the severer cases, both acute and chronic, very much above normal." The author finds that in simple chronic glaucoma the chances of preserving the present state of vision by an iridectomy varies with the pulse tension, the nearer normal the pulse tension the better the prognosis with iridectomy. He also finds that the higher the pulse tension the more likely, as a rule, is the use of mydriatics to be followed by glaucomatous symptoms, and that the pulse tension may decide for or against the use of a mydriatic.

In the treatment of corneal ulcers the author finds that a record of the pulse tension, by pointing out the existence of other abnormal conditions than those in the cornea, may suggest an underlying cause and influence treatment, and in immature cataracts he gives serious consideration to the pulse tension before operating, stating that "as a rule, the higher the blood pressure the greater are the chances that there exist within the intraocular vascular system of old people degenerative changes which will interfere with the absorption of any particles of lenticular cortex left behind."

In iritis, with high blood pressure, pain is relieved by local bleeding; with low blood pressure bleeding does not give such relief.

He refers to the value of the blood pressure in intercepting lesions of the retina and optic nerve, and to its practical value in certain cases of eyeache and headache. W. R. M.

## IRIS.

Iritis and Iridectomy.—Bronner, Adolph, Bradford, Eng. (Report of Dec., 1908, meeting of the Ophth. Society of the United Kingdom,*Brit. Med. Jour.*, Dec, 19. 1908.) The writer pointed out that most text-books laid down the law that iridectomy should never be performed in cases of iritis as long as there was any inflammation present. Most surgeons were of the same opinion. The result was that in many cases of iritis the vision became permanently impaired by posterior synechiae, opaque anterior capsule, and secondary glacoma. In six of his own cases of iritis he had, however, performed iridectomy, when there was well-marked inflammation present, and with excellent results. It was of great importance that in specific or rheumatic cases general treatment should be carried out energetically. Iridectomy should be performed in all cases of iritis except serous iritis and sympathetic ophthalmia, in which, in three or four days, the usual methods of treatment, 2 per cent. atropine ointment, dionine, leeches, hot fomentations, had not dilated the pupil or removed the pain, or in which there was the slightest increase of tension. It did not matter in the least if there was any inflammation present or not. Iridectomy caused decrease of inflammation and pain, broke down adhesions of the iris, and prevented opacities of the anterior capsule and secondary glaucoma. C. H. M.

## LACRIMAL APPARATUS.

Notes on Ten Cases of Primitive Mycosis of the Lacrimal Canaliculi.—Chesneau (*Annales d'Oculistique,* Dec., 1908). The two patients had been annoyed for months with slight conjunctivitis, epiphora, itching, etc., which resisted various treatment, and when the canaliculi were slit, masses of actino-mycosis were found. G. C. H.

On Dacryocystorhinostomy According to Toti.—Shirmer. O., Strassburg (*Zeitschrift fuer Augenheilkunde,* xx, 1908, p. 541). It is generally conceded that extirpation of the tear sac or insertion of a silver prothesis in place of the extirpated sac are not ideal operations. S. reports 6 cases, on which he performed with good results Toti's operation (Clinica moderna. Firenze, 1904. No. 33). After the usual incision for extirpation of the tear sac, the periosteum at the anterior lacrimal crista and the internal ligament are severed and the sac is lifted with the periosteum from the bone as far as to the posterior crista. The lacrimal fossa and the nasal wall of the sac are laid bare and large corresponding pieces are cut out of each, a iodoform tampon is placed into the opening of the bone and carried through the nasal opening, the sac replaced and the skin sewed. No attention is paid to the nasolacrimal duct.

S. devised 2 modifications: posterior tamponade to oviaid aspiration of blood, and the use of Grünwald's forceps for cutting the bone instead of the chisel. The catarrh of the tear sac subsided and an open passage to the nose was obtained. In 3 cases a slight degree of epiphora remained, which was not to be wondered at, as the normal mechanism for conducting the tears, according to S.'s investigations, aspiration from the sac during winking and expression of the aspired liquid by the elasticity of the sac, was destroyed by the operation. S. considers Toti's operation as a valuable addition to our operative methods. C. Z.

PHYSIOLOGICAL RELATIONS BETWEEN EYE AND NOSE AND TREATMENT OF DISEASES OF THE NASOLACRIMAL DUCT.—LIMBOURG, PH., Coeln (*Archiv fuer Augenheilkunde,* lxii, p. 78), mentions numerous points which prove that aspiration is the most important factor for the conveyance of the tears into the nose. Therefore treatment of affections of the nose which interfere with normal respiration, also cures epiphora. Long continued probing of the lacrimal duct acts decidedly unfavorably on the nose. His experience of 10 years taught L. that probes ought not to remain longer than about 2 minutes in the duct. Large probes are preferable. Especially purulent affections of the tear sac are readily cured with large probes introduced for a short time, although the great value of extirpation of the lacrimal sac in some cases is recognized.

C. Z.

## LIDS.

PTOSIS TREATED BY THE CAUTERY.—WRAY, CHAS, London (*Ophthalmoscope,* Oct., 1908). The lid is everted so as to expose the region of the attachment of the levator to the upper margin of the tarsus. The region is then punctured with the actual cautery. The holes are burned in rows. The number of holes correspond to the amount of effect desired. The same procedure can be carried out through a skin incision in the lid. If the latter method is adopted, cocain can be injected subcutaneously, and if by way of the conjunctival side of the lid cocain should be instilled. M. B.

ON AIR EMPHYSEMA OF THE ORBIT AND LIDS.—SALUS, R. (From the eye clinic of Prof. A. Elschnig in the University of Prag., *Zeitschrift fuer Augenheilkunde,* xx, 1908, p. 342), reports in detail 4 cases of air emphysema of orbit, lids and ocular conjunctiva, observed within quite a short time. In 3 the medial orbital wall was injured, in the fourth the lower.

The emphysema is due to communication with the ethmoidal cells after lesions of continuity of their orbital wall, the lamina papyracea, with the nasal cavity in fractures of the lacrimal bone, the frontal and maxillary sinus with their recessus in the orbital walls. By his experiments on human heads in the anatomic institute, S. proved that the lamina papyracea is a place of predilection for indirect fractures in traumatism of the orbital walls. He therefore thinks that the traumatic emphysema with intact eyeball can, in general, occur only by indirect fractures. C. Z.

On Senile Spastic Entropin and Its Treatment.—Goldzeiher, W., Budapest (*Klinische Monatsblätter fuer Augenheilkunde* XLVI, 2, 1908, p. 426), attributes senile spastic entropion to an isolated spasm of the musculus ciliaris Riolani, the fibres of which are situated closely to the inner edge of the lid around the ducts of the Meibomian glands and are separated from the main portion of the sphincter palpebrarum by the bulbs of the cilia. It is always combined with a flabbiness of the skin of the cheek, the lacking elasticity of which cannot counterbalance the tonus of Riolan's muscle. This has not been sufficiently considered in the operative methods so far in use, as Gaillard's sutures, excision of a horizontal fold of the skin, linear cauterization, oblique blepharotomy of Stellwag, so that relapses occurred. G., therefore, devised a new method, which is a modification of that of Busch, published in 1858. It is based on the observation that the entropic lid margin resumes its normal position if the skin of the cheek is pulled outward and downward: ½ cm from the temporal angle of the lid an incision, 2 cm long, is made downward and toward the temple. From the ends of the incision and isosceles triangle is cut out downward and toward the nose and the edges united by sutures in a position ascertained by precious approximation of the edges and observing the effect on the lid. All cases operated upon were perfectly cured and no relapse occurrd.

C. Z.

## MATERIA MEDICA AND THERAPEUTICS.

The Treatment of Blenorrhoea Neonatorum with Bovine Serum.—Gilbert, W. (*Weiner Klinische Rundschau*, Aug. 23, 1908). In this disease the author employs instead of antiseptics, bovine serum, for the purpose of cleansing the conjunctiva, every two hours. If the serum is kept on ice, it retains its strength for about 24 hours. The serum does not kill the cocci but converts them from a parasitic to a saprophytic type. The treatment with silver nitrate may be combined with the serum. J. G.

On Dissolving Blood in the Vitreous by Hemolytic Serum and Chemical Substances. Statter, C. H. (*From the eyeclinic of Prof. C. Hessein, the University of Wuerzburg.*

*Archiv fuer Augenheilkunde,* lxii, 1908, p. 155). Boemer was the first who proved experimentally on rabbits, that hemorrhages in the vitreous may be made permeable for rays of light by injecting hemolytic serum. Elschnig tried it in relapsing hemorrhages of the vitreous in a human eye, but had to enucleate the eye on the 29th day after injection on account of violent inflammation. He found microscopically necrosis of the retina, plastic iridocyclitis and chorioiditis.

Sattler reports on his experiments on rabbits and monkeys. In the eyes of rabbits he found colossal hyperemia of the uvea, necrosis of the retina and plastic inflammation in the vitreous, no microorganisms. In one eye of a monkey the injection of hemoglobin had produced necrosis of the retina, in two others an intense plastic iridocyclochorioditis in different stages, which exactly equalled the findings observed by Elschnig on a human eye. The course of the inflammatory processes and the microscopic examination, especially the fact that after six weeks and as late as nine months after injection, foci of infiltration were found in the chorioid, suggest an infectious cause, even if the staining of the sections revealed no microorganisms. From a further series of experiments on the action of serum, heterogeneous to the species, which will be reported at a future time, S. believes that the inflammation is due to cytotoxin and not to accidental microorganisms. Then experiments with blood dissolving chemical substances on the dead and living eye are reported.

Sattler's conclusions are: On account of the above mentioned violent inflammatory reactions, attempts to dissolve hemorrhages of the vitreous in man by hemolytic serum are so far not feasible. Of blood dissolving chemical substances the saponines have no affinity to the ocular tissues. Their toxicity for the living cells by far exceeds their blood dissolving properties. Therefore the saponines are not applicable in the therapy of hemophthalmus. C. Z.

ON SERUM-THERAPY IN DISEASES OF THE EYE.—DEUTSCHMANN, Hamburg, Germany (*Ophthalmoscope,* Dec. 1908). The serum is obtained from horses which are fed with prescribed doses of yeast in a certain definite manner for the purpose of obtaining their blood-serum. This is known as the Deutschmann Serum. There is another, modified by Dr. Enoch, who precipitates out the active material from the serum and dissolves it in water, which is known as the Deutschmann Serum E. The latter product has the advantage over the ordinary serum in that it is of double the strength and it never produces any kind of serum-sickness. The author has found it curative in infections of the eye such as secere corneal and mitastatic inflammations. It exerts no harmful action, and in the presence of a fever the temperature is reduced. The serum is best injected intramuscularly, in the anterior chest wall or lateral abdominal wall. In chidlren, doses of 1 c. cm. to 1½ cm. are injected; in adults, 4, 6 and, finally 8 c. c. m. twice, thrice, or oftener; in weekly, according to the effect obtained. The doses are then slowly reduced. The dose in the beginning should be large, and then reduced when a decided improvement has taken place.

M. B.

Contribution to Deutschmann's Serum Therapy.—Zimmermann, Görlitz (*Die Ophth. Kl.*, July 5, 1908), has employed Deutschmann's serum in a series of cases of infected wounds and ulcer and as the result of his experience he concludes that it cannot be justly said to be inert *ad acta,* if one must still be cautious in judging of its action upon diseased eyes. In cases of pneumococcus ulcer, iritis and postoperative infection if employed early, it seems to be without doubt, of value. much seems to depend upon its proper administration. Its possible value as a prophylactic agent must be considered in cases of suspicious perforating wounds of the globe and in cataract operations in decrepit persons or in the presence of other conditions in which infection might eventually be feared.

Because of its absolute harmlessness the extensive use of the serum is to be desired, and it is better to use it a day too soon than a day too late. W. Z.

Further Communication Upon Paraspecific Serum Therapy in Eye Affections.—Zimmermann. Görlitz (*Ophth. Kl.*, Nov. 5, 1908,) has employed Behring's diphtheria serum in a series of 28 cases of inflammatory and traumatic conditions of the eye. When the initial dose is 1500 units he finds that in many cases only one injection is required to bring about a cure. If 1000 units were first used, as was the case in decrepits, the result was less favorable and a repetition of the dose did not have nearly the effect of a large initial dose. If early beneficial effect is not noted no further improvement will result from repeated injections. In not a single instance was any complication noted, no skin exanthemata or any subjective disturbance. He says that while in his series there are some cases in which a combined local and serum therapy was employed he is convinced that eyes were thus saved that would have been lost notwithstanding energetic surgical treatment The list treated contains cases of infected corneal ulcer, post-operative infection and severe iridocyclitis, traumatic cataract, gonorrheal iritis, orbital cellulitis from infection. Four unsuccessful cases were: acute post-operative infection, two large septic ulcers of the cornea and a purulent dacriocystitis.

W. Z.

A CONTRIBUTION TO THE SERO-THERAPY OF DEUTSCHMANN.—ZIMMERMANN (*La Clinique Ophtalmologique,* September 25, 1908). The author states that the publications of A. v. Hippel on the utility of Deutschmann's serum in various ocular affections are of such a character as to convince the most skeptical. Darier and some other French oculists long ago admitted that there is a para-specific serotherapy, and explained this by advancing the theory that the serum employed excited the production of antibodies. This excitation they claimed would be the more marked in the case of a specific serum, but that while there would be less effect upon a different bacterium, still there was an antitoxin produced by a para-specific serum. In France it is the serum of Roux which has been employed. In Germany that of Deutschmann. Zimmerman has employed Deutschmann's serum in many conditions, and to the exclusion of other means.. He details several cases in which he used 2 c. c. hypodermically every second day. These cases include sepsis, traumatic corneal ulcers with hypopion, sympathetic ophthalmia and post-operative infection, etc.

B. E. F.

SEROTHERAPY IN OCULAR AFFECTIONS.—DARIER (*La Clinique Ophtalmologique*, July 25, August 10th and 25th. 1908). This paper of Darier's gives in detail views which he has previously given in other reports of cases heretofore published. . The synopsis with which Darier heads this last essay is as follows. The antidiphtheritic serum has an action more marked than all the sera employed in ocular therapeutics. Theoretic explications. Clinical observations. Infectious ulcers of the cornea. Traumatic and post-operative infections.

Endogenous infections. Importance of these anti-infections. Serotherapy to the practitioner. The administration of the serum, is it as active as that by hypodermic injection. This mode of application, does it prevent the avoidance of serious results sometimes so disagreeable.

Darier's paper is quite long, and in it he upholds the view 1st. that there is a serum, as yet undiscovered, for the overcoming of *all* the known pathologic bacteria. 2nd. that the anti-diphtheritic serum is very serviceable especially for destroying the toxins of the pneumococcus not only where the microbe is making eye lesions (especially corneal ulcers, hypopion, as well as iridocyclitis both traumatic and endogenously septic), but that he believes that sepsis from other microbes may be neutralized by this serum. Darier believes therefore in a non-specific serotherapy—a paraspecific anti-infectious serum—that the antidiphtheritic serum from its results locally on pneumococcic lesions in the eye as well as its systematic effect upon pneumonia, is a producer of antibodies other than those essential for the destruction of the diphtheritic bacillus. Darier gives details of several new cases in his paper successfully treated by the diphtheritic serum of Roux, the dose of which is 10 cc. repeated every day or every second or third day. In post-operative eye sepsis Darier has had marked success with this serum. B. E. F.

OCULAR LESIONS PROVOKED BY THE OPHTHALMO-REACTION.—ADAM (*La Clinique Ophtalmologique,* June 25, 1908). Since the publications of Wolf-Eisner and Calmette, the ophthalmic reaction has been employed many times. Many authorities have claimed that the reaction is not absolutely sure and that it can endanger the eye.

Adam states that when the eye is healthy a mild conjunctiitis follows with sometimes the appearance of small hemorrhages. In scrofulous infants phlyctenula may occur. The cornea may take part in the reaction and keratitis follow. When the eye is diseased the ophthalmo-reaction test becomes dangerous. B. E. F.

A BRIEF NOTE UPON THE VALUE OF THE OPHTHALMO-TUBERCULIN TEST IN THE QUESTION OF SURGICAL TREATMENT OF ORBITAL DISEASE.—OLIVER, C. A., Philadelphia (*Ophthalmoscope,* Dec. 1908). Three cases of localized orbital disease of uncertain etiology gave a positive reaction to the ophthalmo-tuberculin test. They were all placed upon tuberculin therapy. Two of them so far recovered in about four months time as to be considered practically well. The other case is still under treatment, and is rapidly undergoing resolution. The author has been giving much attention to the ophthalmo-tuberculin reaction and his experience has been such as to make him feel favorable to its diagnostic value.

M. B.

CONCERNING SOME UNUSUAL RESULTS FROM THE USE OF IODOPIN TREATMENT.—ZIMMERMANN, Görlitz (*Die Ophth. Kl.*, Sept. 20 and Oct. 5, 1908). In a case of probable gummatous meningitis with optic neuritis and peri-neuritis on the right side and a slight perivasculitis on the left side with the pupil of the left eye wider than that of its fellow and reduced to R. E. 2/l and L. E. 5/xxv, rapid improvement followed the hypodermatic use of iodipin in dosage of 10 cc. of a 25% solution so that 5 weeks later V. of R. E.=5/v pt.; L. E. 5/v full. The neuritis had subsided and the pupils were of normal size and reaction.

W. Z.

THE ACTION OF COCAIN ON THE PUPIL.—HENDERSON, E. E. and PARSONS, J. HERBERT, London (*Ophth. Review*, Nov., 1908). The writers have repeated Jessop's experiments on the action of cocain upon the pupil, dividing the sympathetic nerve in the neck of two rabbits and removing a piece. Jessop showed that the pupil remained smaller than that on the opposite side and did not react when cocain was instilled into the conjunctival sac; also that cocain caused dilation of the pupil of a normal eye immediately after excision; that there was no reaction to cocain in a case of sympathetic paralysis; from these results it was concluded that cocain acts locally on the nerve endings of the sympathetic in the iris.

The experiments of the writers confirm the results obtained by Jessop and extended his observations by showing that the result is the same whether the cervical sympathetic alone is cut or the superior cervical ganglion removed; furthermore, the result is permanent, or at any rate for more than two years. They cannot, however, bring forward any very satisfactory explanation of the phenomenon.

C. H. M.

OPHTHALMIA NEONATORUM TREATED BY ZINC IONS.—RAMSDEN, H. KAY, London (*Brit. Med. Journ.*, Nov. 7, 1908). The writer calls attention to a new method of treating this disease; although he has tried it in one instance only, he hastens to publish the case so that it may be confirmed by others: The conjunctiva of the diseased eye was everted and a positive electrode which consisted of some cotton-wool saturated in a 2 per cent. solution of zinc sulphate was applied. The nurse held the negative electrode in the child's hand. The battery employed was an ordinary bichromate battery which gave twenty volts, and half a milliampère current was passed for three minutes. Twelve hours after the application the inflammation was subsiding and another application was made. Two days later the case was cured. C. H. M.

ON THE TREATMENT OF OPACITIES OF THE CORNEA CAUSED BY LIME WITH AMMONIUM PREPARATIONS.—HARREN, DR., Viersen (*Centralblatt fuer praktische Augenheilkunde*, 1908, p. 324), reports 2 cases in which he had very good results with eye baths with tartarate of ammonium 10%, according to the method devised by H. Guillery. Cocain was freely used to alleviate the burning sensation of the solution and to make the tissues more accessible by its loosening effect on the epithelium of the cornea. C. Z.

FIBROLYSIN IN OPHTHALMIC PRACTICE.—GROSSMAN, KARL (*The Lancet*, Jan. 16, 1909). Fibrolysin, introduced in 1905 by Mendel of Essen, is a preparation which seems to be destined to take an important place in the Pharmacopœia.

As far back as 1892 Dr. von Hebra published the favorable results which he had obtained in the healing of lupus and of cicatrical tissue by means of thiosinamine, a preparation made from the oil of mustard, smelling strongly of garlic, and of the chemical composition of allyl-sulpho-urea. These good results were verified by others, but the remedy did not become popular, for one very good reason—the almost complete insolubility of the preparation in water.

Fibrolysin represents a combination of one molecule of thiosinamine with half a molecule of salicylate of sodium. Its principal advantage over thiosinamine is the easy solubility in water and the absence of any irritant effect when injected subcutaneously. The drug itself is a white crystalline substance with a bitter taste. It decomposes easily when exposed to air and light and is therefore put up in closed tubes of brown glass in doses of 2.3 cubic centimetres of a 15 per cent. aqueous solution, equivalent to two decigrammes (three grains) of thiosinamine.

The effect of fibrolysin on cicatrical tissue is very remarkable; turgescence takes place, the individual fibres lose their sharpness of outline, the nuclei are pushed asunder, and the tissue appears more succulent and swollen and altogether enlarged. The whole scar becomes more relaxed and permits of movements altogether impossible before injection. This effect is considered to be due to a serous infiltration or flooding which softens the old inflammatory and now hardened fasciles similar to the hyperemia of the Bier method, and renders them thereby more readily amenable to absorption by the increased lymph stream. The result, transient at first, becomes more and more permanent by repeated injections. It is noteworthy that fibrolysin has this effect only on pathological connective tissue.

The mode of application is by injection, either intravenous, intramuscular, or subcutaneous. Under the influence of the drug dilation of strictures and stenoses of esophagus, pylorus, lacrimal passages, by bougies become possible and remain permanent.

He reports several cases, one of cicatrical shortening of the eyelids, which would usually have been subjected to a not altogether successful plastic operation in which after ten injections, first of 1 cc., later of 2.3 cc., the eyelids opened and closed well, another of retrobulbar neuritis after influenza, six injections "thoroughly satisfactory"; clearing of corneal opacities not so satisfactory, "all improved a little"; "great success" in 2 cases of post-synechiæ; 3 injections in lacrimal stenosis rendered further probing unnecessary.

He shall in future apply the drug in every ophthalmic case in which any cicatrical tissue present, old or new, may account for undesirable symptoms.

He mentions some disagreeable symptoms which have been described as sometimes accompanying or following the application of fibrolysin—viz., a burning sensation round the point of injection lasting half a minute to a couple of hours, discoloration of a yellowish, later bluish, tint, formation of a hard nodule of the size of a cherry which may take weeks or even months to disappear. There are also general symptoms reported; headache, lassitude, and heaviness lasting from a few hours to a day or more. Dr. Urbantschitsch mentions a case where regularly about 12 hours after each injection menstruation occurred; this completely resembled the normal menstruation and lasted from two to three days. For this reason the further administration of the drug had to be abandoned in this instance. Another case is mentioned in which epistaxis occurred.

As a note of warning I must not forget to quote the experience which Glas relates in 1903 in a case of naso-pharyngeal syphilis. After the fourth injection of thiosinamine succulence and swelling of the subglottis set in and developed to such a degree that owing to the great dyspnœa tracheotomy had to be resorted to. Commence with a small dose, 1.0 cc., and avoid the time of menstruation. H. V. W.

## MISCELLANEOUS.

Ophthalmic Conditions in the Government Schools in Egypt and Their Amelioration.—MacCallan, A. F., Egypt (*Ophthalmoscope*, Nov., 1908). Education is carried on in Egypt, mainly by the Ministry of Education, by means of primary schools established in Cairo and Alexandria and the capital town of each province, and by means of secondary schools established in Cairo and Alexandria. The goal of the primary schools is the primary certificate, without which the pupil can not enter the Government service as a clerk, and at the secondary schools the secondary certificate, or the baccalaureate, is granted as necessary qualification for the higher Government posts, and for admission to the professional schools. Trachoma among the pupils is almost universal, and those who are exempt on admission soon become infected. The author was able to carry out systematic routine treatment in one school which contained 500 pupils. The Minister of Education placed funds at his disposal for that purpose. It was impossible, however, to be as thorough in his methods as he had planned, as the curriculum would have been interrupted. 87.2 per cent .of the pupils treated showed improvement, while of the untreated only 5.9 per cent. were better at the end of the same period.

M. B.

The Teaching of Ocular Pathology to Graduates and Undergraduates in Medicine.—Wood, Casey A., Chicago. (*Ophthalmic Record*, Nov., 1908). The lengthening of the medical curriculum from three to four years has made it possible to extend the teaching of pathology, and a further extension of the curriculum means specialized teaching by subdividing subjects which are at present being taught. This will make it possible to devote more time to ocular pathology and the bacteriology of ocular diseases. In addition to sectional instruction, a portion of each of the weekly lectures can be devoted to histology and pathological anatomy of the ocular apparatus illustrated chiefly by stereopticon views. The most important of all is the time spent in the laboratory. Here the student makes a systematic study of those tissue alterations which he is at the same time learning to recognize from clinical observations in the dispensary and from lectures. The author sees no reason why our undergraduate schools should not enter the field of post-graduate teaching. The adoption of such a plan would, among other results, elevate the standard of post-graduate instruction—particularly in ophthalmology—and would make it unnecessary as well as undesirable for our American students to go abroad, as they do now, for any considerable portion of their instruction in matters pertaining to diseases of the eye. M. B.

Teaching the Subject of Ocular Refraction.—Jackson, Edward, Denver (*Ophthalmic Record*, Nov. 1908). In teaching refraction to undergraduate students, they should be divided into two cases, those who will take no special interest in the eye, and those who will practice ophthalmology. As students come to the study of medicine better prepared by collegiate training, the final year of the medical course may be given more largely to eclectic studies, and among these refraction may well find a place. The advice to students to get a trial case and do a little refraction work while waiting for general practice is partly responsible for the low estimate often placed on the value of the accurate correction of refractive errors. The teacher of refraction should find out the deficiencies in the preliminary training of students, and should supply the more important preliminary facts. The student should have a good acquaintance with the elements of algebra, plain geometry and plain trigonometry. He should be able to think in geometrical terms. The theory of refraction should be given as a part of the course of anatomy and physiology to the second year students. Every student should be taught the use of the ophthalmoscope. In teaching the clinical aspects of refractive errors the so-called "case method" may be employed with advantage. M. B.

THE LIMITATIONS OF OPHTHALMIC PRACTICE.—VAIL, D. T., Cincinnati, Ohio (*Ophthalmic Record,* Nov. 1908). The study of ophthalmology should include every bodily ailment which has its ocular phase, and the practice should include thde various surgical and therapeutical measures directed toward the cure of the abnormal ocular condition. The time should come when ophthalmology will be taught in this country in such a manner that one can meet the requirement that in order to specialize he must be so prepared by preliminary training that he can pass an examination before a special board of examiners.

M. B.

INVESTIGATIONS ON THE DISTANCE SENSE OF THE BLIND.—WOELFFLIN, E., Basel (*Zeitschrift fuer Sinnesphysiologie*, 43, 1908, p. 187). Distance sense is the faculty of the blind to perceive larger objects at a certain distance, whereas orientation means the sum of distance sense, the sense of hearing, pressure, temperature, smell ,etc. For testing the distance sense W. recommends an empty hall, at least 8 x 14 m., and a uniform size of the test objects, viz., a board of pine wood, 1 m. square and developed distance sense.

W. Therefore divides the blind into 3 groups: 1, with well developed distance sense; 2, with weak distance sense; 3, without distance sense. He selected only blind with well developed distance sense for his examinations, which gave the following results: The distance sense is not only dependent upon the quality of the object (wood, metal, felt, etc.), but also upon its size. By covering different parts of the face he found that the forehead is the most sensitive part of the distance sense, then the sides of the face and the least the back of the head. An object is felt later, when approached to the patient, than if the patient moves towards it, and later if the object is rapidly approached, than if the patient walks slowly towards it. It seemed important that the reflected air waves impinges upon the forehead vertically, while oblique reflection lessens the perception. If a blind is arrested in his walk at the moment, in which he perceives the object by his distance sense, the perception grows stronger for a few seconds, to remain for about a minute in its former strength, and sinks rapidly to a minimum. The distance sense may be cultivated by practice, but patients lacking distance sense cannot acquire it by exercise. In all tests the ears must be tightly closed by the moistened index fingers. The distance sense is independent of hearing as shown by the well-developed distance sense of blind and deaf persons. Nor could W. ascertain an increased sense of temperature in the blind. Uhthoff, Greisbach and others found that the sensibility of the skin of the blind with regard to topography and pressure was not increased.

It seems most probable that the distance sense is a function of the sensitive nerves of the face, particularly the 5th nerve. Whether special nerve fibres conduct this sensation, or whether this occurs on the paths reserved for the senses of pressure and topography, is still an open question. C. Z.

ON SO-CALLED "SPONTANEOUS PANOPHTHALMITIS."—KUMEL, R. (From the Eye-clinic of Prof. Oeller in the University of Erlangen. *Zeitschrift fuer Augenheilkunde* xi., 1909, p. 360). A delicate, rachitic, child, aged 11 months, of scrophulous habitus, without signs of congenital lues, acquired after vaccination eczema of forehead, nose, mouth and several places of the body. Four weeks after vaccination the right eye became inflamed. It showed mixed injection, chemosis, cornea was hazy, anterior chamber shallow, without hypopyon, iris yellowish green, indistinct, pupil wide (Atropin?), yellowish grey exudation in the pupillary area, T -2. Six days later the lids swelled, so that they could hardly be separated, chemosis was very intense, eyeball protruded, T + 3, thin purulent secretion, cultures from which as well as from the blood contained staphylococcus pyogenes albus. The swelling gradually subsided, the eye became perfectly soft and shrunken, root of iris retracted, and the yellow reflex from the pupil presented the picture of pseudoglioma.

As to the etiology of this metastatic irido-chorioiditis with the aspect of commencing panophthalmitis, K. considers it improbable that the staphylococci, circulating in the blood, originated in the vaccination wounds or scars, as these showed not the least suppuration and were covered with simple blood crusts, but attributes the pyemia to the eczema. It is a well-known fact, that a circumscribed eczema may spread after vaccination, so that some countries, *e. g.,* Bavarian children, affected with eczema, are excluded from vaccination. Staphylococci are found in most cases of eczema and since the pus in the palpebral fissure and the blood, and most likely also the interior of the eye, contained staphylococcus pyogenes albus, the germs apparently were carried from the eczema pustules into circulation and caused the metastasis in the eye, in concordance with the observations of ocular metastases in diseases of the the skin, especially furuncles. (We refer to Pagenstecher's case reviewed in this No. of Ophthalmology—Reviewer.)

The prognosis for the eye is bad, for life relatively favorable. In this case the general affection was not serious, as shown by the moderate fever. Seven cases of kryptogenetic panophthalmia from literature are briefly quoted. C. Z.

On the Influence of Pregnancy and Labor on Diseases of the Eye.—Fejer, Julius, Budapest (*Archiv fuer Augenheilkunde*, lxii, 1908, p 42). While quite a number of ophthalmologists and gynecologists demand an interruption of pregnancy in cases of severe keratitis, retinitis, optic neuritis and detachment of the retna, F. could find nothing in literature as to what should be done in pregnancy of multiparæ, who are affected on both eyes with excessive myopia and central chorioiditis. He reports a case of pregnancy of 2 months in a mother of three children who had myopia R — 2, V 5/1, L — 16,, V 5/l, circular conus of half the size of the optic disc and moderate chorioretinal changes. The myopia had, according to the statement of the patient, considerably increased after each delivery and F. was asked for his opinion as to the influence of pregnancy on the progress of myopia. He concluded that the disturbances of metabolism during pregnancy, the greater demand on the circulation, the strain connected with labor, especially the abnormal pressure cannot be without influence on the patients and eyes, easily yielding to increased pressure, and may aggravate the central inflammation of the retina and promote the progress of myopia, thus endangering the sight.

After another ophthalmologist had given the same opinion abortion was performed with the best result. An examination 3 years later revealed that the myopia had not progressed.

F. recommends careful observations of the connection between pregnancy and excessive myopia for gaining better information as to the proper treatment of such cases.

Then the following rare case is reported: A woman, aged 22, had a miscarriage in the 6th month of pregnancy in consequence of influenza. After a week her sight was impaired. The face and the lids of both eyes were intensely swollen, with chemosis, exophthalmus, edema of the retina and immense swelling of both discs, apparently due to septic thrombosis of the cavernous sinus and the ophthalmic vein. Death ensued after 6 hours. C. Z.

DIAGNOSIS OF THE COMMONER INFLAMMATORY DISEASES OF THE EYE.—WOODRUFF, THOS. A., Chicago, Ill. (*Montreal Medical Journal,* Jan., 1909). This is a most interesting article for the general practitioners, describing as it does, nearly all of the common inflammatory diseases subjective and objective, which are unusually condensed and accurate; the description of purulent conjunctivis being especially good. This is a paper that general practitioners might read with profit, and it is to be hoped that other oculists will follow such lines. A very useful table giving the differential diagnosis of the common eye diseases is given. The only suggestion a reviewer can give is that the treatment could have been added. A. M. MACW.

OCULO-DENTAL AFFECTIONS IN NURSING INFANTS.—BONSIGNORO (*La Clinique Ophthalmologique,* July 10, 1908).

The writer recites a number of abnormal ocular conditions, the result of an irritating dental reflex, which he states should be looked for and when found, the cause removed.

B. E. F.

HYDROMINERAL AND MARINE RESORTS IN THE TREATMENT OF OCULAR AFFECTIONS.—TROUSSEAU (*La Clinique Ophtalmologique.* July 25, 1908).—The author states that diseases of the eye are often cured at these places, but that the principal indications from these cures are not clearly formulated; that eye diseases are often dependent upon diathesis, general conditions or alterations situated in a diotant organ. The rheumatic at Aix, the scrofulous at Unagi, for example, are benefited at these points. The writer commends several of the watering places at which general diseases causing or complicating eye troubles are benefited or cured. B. E. F.

## MUSCLES.

Further Experiences with Partial Transplantation of Tendons on the Ocular Muscles.—Hummelsheim, E., Bonn (*Archiv fuer Augenheilkunde,* lxii, p. 71.) 8 months after the onset of a complete paralysis of the left external rectus muscle, of a woman, aged 47, of unknown etiology, which did not yield to mercurials, iodide of potash and the constant current, H. sewed one-half of the superior rectus and one-half of the inferior rectus, within Tenon's capsule, on the insertion of the abducens. The sutures were removed on the 11th day. Very soon a good result could be observed: In looking straight forward into distance, both ocular axes were parallel. The field of binocular monopia, tested at 5 m., extended horizontally to 12° to the left, after correction of 2.00 hypermetropia to 16°, at a distance of the radius of the perimeter to 30°. In monocular fixation the eye followed to 48° to the left, with a slight rotation inward. The adduction faculty of the left eye exceeded that of the right eye a trifle. The patient was not disturbed by diplopia.

Gradually pareses of the left cucullaris and sympathetic, and 5 months after the operation paresis of the rectus superior, developed. The latter could not very well be traumatic, as it did not exist 2½ months after the operation, and had not been observed in 3 other cases nor in H.'s experiments on monkeys. H., however, emphasizes that the division of the muscle must not extend further than 12 mm. for superior and inferior recti, because, closely above, the larger nerve fibres branch off. If properly performed, the method promises good prospects of results and H. recommends it for further trial. Two photogravures illustrate the cosmetic effect before and after operation. C. Z.

The Treatment of Strabismus.—James, George Brooksbank, London, Eng. (Report of Dec., 08, meeting of Ophth. Society of the United Kingdom, *Brit Med. Jour.,* Dec. 19, 1908). The writer mentioned the fact that most surgeons at the present time were agreed as to the importance of early orthoptic treatment; but there still appeared to be much difference of opinion with regard to the age at which operation should be undertaken in the most obstinate cases and as the particular operation which should be performed. The usual after-treatment of tenotomy was looked upon far too lightly. He rarely performed tenotomy, but when he did so that case was treated in all respects like an advancement; both eyes were bandaged and the patient kept in bed for six days. During the last few years he had confined himself to performing advancement of the external and internal recti muscles in cases of convergence and divergence respectively. Without tenotomy of the antagonistic muscle 20 degrees could be got by the advancement of one muscle, and if that, followed by orthoptic treatment, were insufficient, then the corresponding muscle of the other eye should be advanced. He then described the method of operation he advocated: The muscle to be advanced was carefully isolated from the surrounding tissues and the sclerotic near the cornea was thoroughly exposed. A short, straight, double-edged needle, was threaded with No. 0 white silk and passed through the conjunctiva and Tenon's capsule, just below the lower border of the tendon, and at a varying distance behind the attachment of Prince's forceps which had been put on to hold the muscle previous to dividing its insertion. The needle was then passed vertically through the superficial fibres of the sclera for about 2 mm. as close to the corneal margin as possible. It was then carried backwards parallel to its original course, and emerged through the muscle and capsule, and close to the free end of the retracted conjunctiva about 2 mm. above the point of entry. A similar thread was then passed through the upper margin of the muscle; the threads were then tied, the assistant placing the muscle in the required position by means of the attached Prince's forceps. The forceps were removed by an oblique section of the tissues just behind their attachment, and the wound was closed with a fine suture. He claimed the following advantages for the operation: 1. The surgeon knew precisely what he had done. A. The knots in the suture lay some considerable distance from the cornea, and so did not irritate it. 3. The hold on the eyeball and muscle was firm. 4. The stitches were easy to remove, and usually came away themselves on the ninth day. He had operated on some 35 cases of convergence, and in those in which the squint did not exceed 20 degrees he had obtained very satisfactory results by the advancement of the external rectus of the deviating eye. He referred to the work of Landolt on the subject.

C. H. M.

## MYOPIA.

Myopia and Its Prevention.—Bert (*Weiner Klinische Wochenschrift,* Aug. 23, 1908). The author considers the chief cause of myopia in school children, the "nearby" work, such as reading, writing, etc., and he says that it becomes, therefore, more important to limit this kind of work, than to pay too much attention to illumination.

He believes the greater frequency of myopia in German school chidlren to be due mainly to the use of the Gothic Alphabet, and he is therefore rather in favor of the Latin alphabet in printed matter.

From 1870-1891 more than 50% of all the pupils in the higher classes were found to be myopic, and in 1906 only 25%. This he explains by the fact, that the afternoon sessions are not spent in reading, but rather in relaxation, sport, and gymnastics. J. G.

## NERVOUS SYSTEM.

Methodical Occlusion of the Eyes in the Study of Their Etiological Significance in Disturbances of the Nervous System.—Jenkins, N. B., New York (*New York Medical Journal,* Jan. 30, 1909). A method of occlusion of the eyes described in the following may be an aid in the observation and treatment of spasms of the facial muscles, chorea, and other disturbances of the nervous system, which Stevens[1] long ago attributed to disorder of the eyes.

A surgical bandage, preferably of dark material, is so applied as to wholly exclude light from both eyes. In suitable cases atropin may be instilled before bandaging. If the bandage is worn for several days without producing any mitigation of the symptoms, it is reasonable to infer that disorder to the eyes is not a cause of the disturbance. If the symptoms disappear while the patient is wearing the bandage, the following supplementary test may be tried:

The bandage is applied to one eye only. If the symptoms subside it is possible that the disturbance is more or less due to the excessive work, the weakness, or the insufficient exercise of the ciliary muscles of the bandaged eye.

If the symptoms continue when both eyes are in use, but subside when the right, the left, or both eyes are bandaged, disorder of the extraocular muscles, anisometropia, or inequality of the intraocular muscles may be present.

If the patient uses spectacles the supplementary test may be made by replacing with a frosted (opaque) glass first one and then the other spectacle lens, thus partially excluding from vision each eye in turn, but this is less satisfactory than the bandage. H. V. W.

Total Bilateral Ophthalmoplegia.—Westhoff, C. H. A., Bandoeng, Java (*Centralblatt fuer praktische Augenheilkunde*, 1908, p. 356). A man, while recovering from gonorrheal conjunctivitis, presented the symptoms of typhoid, and, during its course, bilateral total ophthalmoplegia with affection of the motor fibres of the 3rd branch of the 5th nerve developed. As a gonorrhoic origin could be excluded from the absence of all other gonorrhoic symptoms, the palsies were attributed to an accumulation of typhoid toxines, brought about by the unusually large doses of antipyretics, especially chinin and aspirin. C. Z.

Traumatic Paralysis, of Intracranial Origin, of the Fourth and Sixth Pair.—Chaillous (*Annales d'Oculistique*, August, 1908). Chaillous reports two cases, one of fracture of the base of the cranium, and one of fracture in the temporal region. G. C. H.

## OPERATIONS.

Further Experience with the Smith-Indian Operation in the Extraction of Fifteen Cataracts.—Green, D. W., Dayton, Ohio (*Ophthalmic Record*, Oct. 1908). The author's first experience with the operation in a series of twenty-five cases led him to express an adverse opinion. Since then he has seen Maj. Smith perform the operation, and in his second series of cases so operated upon he is disposed to look upon the operation with much favor and says he intends performing the operation from now on in all suitable cases. If his future experience teaches him that if the operation does not give as good ultimate results, especially in cases where vitreous is lost, he will then abandon it. M. B.

Transplantation of the Rabbit's Eye Into Tenon's Capsules.—Wicherkiewicz, Prof. (*Postep Okulistyczny* No. 7, 1908). LaGrange has recommended transplantation of the rabbit's eye into Tenon's capsule to increase the cosmetic effect of enucleation. Prof. W. has performed this heteroplasty in his clinic at the University in 35 cases to test the practical worth of the method and to improve the technic of the operation, and from his experience has arrived at the following conclusions.

1. The implanted and sutured eyeball becomes well attached to the straight muscles and acquires normal movements.
2. The course of healing, considering the operation, is comparatively short.
3. The connection of the implanted globe with the surrounding tissues is intimate, as for instance as a recurrent neoplasm; —not only the orbital tissues but the rabbit's eye itself grows fast.
4. In course of time the implanted globe becomes 1-2 or 1-3 the original volume.
5. The older the subject the greater is the shrinking of the globe, which sometimes becomes so atrophic that it can not be felt.
6. In no instance has the implantation given rise to sympathetic symptoms in the other eye.

From longer observations the author is inclined to restrict this heteroplasty to children or young subjects on account of the unfailing atropy of the implanted globe.

K. W. M., Translated by H. V. W.

REMARKS ON THE MAGNET OPERATION.—HIRSCHBERG, J., Berlin (*Centralblatt fuer practische Augenheilkunde,* 1908, p. 33). Extraction of a piece of iron from the vitreous of a boy, aged 10, into the anterior chamber with the giant magnet and from there with the hand magnet through section with the lance-shaped knife. The piece of iron, weighing 0.01, had by piercing the upper lid and the eyeball lost so much of its momentum, that it did not dash against the fundus, but stuck in the blood coagulum, not very far from the wound of entrance, near the center of the vitreous. After 5 days he had a secondary hemorrhage, which, however, was soon absorbed. V 5/vii and normal visual field.

In discussing secondary hemorrhages H .says that these are easily understood, because the chorioid has been penetrated and the temporary closure of the blood vessels may be loosened or destroyed during extraction. He distinguishes primary hemorrhages in connection with the operation, secondary during recovery, and tertiary after recovery, by a new injury, which in a normal eye would not have had such consequences. The after hemorrhages are not very rare and require great care. Also the hemorrhages occurring with the injury are of importance, as their remnants, enclosed in bluish opacities of the vitreous, may persist for months and demand careful attention. He gives several very interesting instances of these various forms. C. Z.

THE PROGNOSIS OF OPERATION FOR EXOPHTHALMIC GOITER.—REIDEL, Prof., Jena (*Deutsche Medizinische Wochenschrift,* 1908, No. 40, p. 1715). Operated on 50 cases of exophthalmic goiter, out of 623 operations for goiter, and gives the important points of the operation: The operation ought to be done in time, *i. e.,* at the beginning of the disease, and then 9/10 of the enlarged thyroid gland ought to be removed. Pieces of both sides of the gland must be left. At least one large vessel must be preserved. The prognosis is not worse than in ordinary goiter; it depends, in the first place upon the condition of the lungs. C. Z.

PALLIATIVE TREPHINING IN CASES OF CHOKED DISC.—HIPPEL, V., EUGEN (*Weiner Klinische Rundschau,* Oct. 11, 1908). Trephining the skull, to give good results as far as vision is concerned, must be performed before vision begins to diminish. After vision is diminished or entirely lost, the operation will have no effect. Lumbar puncture, in the treatment of choked disc, does not give very encouraging results. Puncture of the ventricle of the brain, without trephining, in tumors of the brain is anatomically impossible to perform. J. G.

SUBTEMPORAL DECOMPRESSION IN A CASE OF CHRONIC NEPHRITIS WITH UREMIA, WITH ESPECIAL CONSIDERATION OF THE NEURORETINAL LESION.—CUSHING and BORDLEY (*Am. Journ. Med. Scien.,* Oct., 1908), report the first case of deliberate surgical intervention in a case of uremia, on the view of its being a pressure phenomenon. The patient was a woman, aged 22, with chronic diffuse nephritis (small granular kidney) and a blood pressure above 230. On ophthalmoscopic examination the swelling of the optic disc was 6 and 7 D. The whole surface of the retina was covered with hemorrhages and exudates. A number of lumbar punctures gave no evidence of benefit. After subtemporal decompressive craniectomy the systolic blood pressure at once fell from 300 to 210 mm. Hg. The headaches subsided; there was no further nausea and vomiting and the stupor rapidly disappeared. Ten days after the operation the swelling of the disc did not exceed 1 D. and the retinal condition had greatly improved. Her general condition was so much improved that the patient left the hospital against advice. Two weeks after her discharge she was re-admitted with a cerebral hemorrhage, from which she died.

The marked improvement after cerebral decompression in this case adds further evidence in support of Taube's hypothesis (favored by Byrom Bramwell, Russell and others) that the cerebral symptoms present in the so-called state of uremia are largely due to pressure from edema of the cerebral tissue.

It goes to show, furthermore, that the condition of albuminuric neuroretinitis is a local edema of mechanical origin. (Abstr. Colorado Med., Dec., 1908.) H. V. W.

## OPTIC NERVE.

Optic Nerve Atrophy in Oxycephalus.—Bednarski, A. (*Postep Okulistyczny*, No. 2, 1908), writes about 7 cases of optic nerve atrophy with abnormal skull development, *i. e.*, with so-called oxycephalus, Enslin limited this abnormality to the crossing of the sutura sagittalis and the sutura coronaria, in the so-called Turmschädel (Scaphocephalus) the entire skull is evenly enlarged. In five of his oxycephalic cases the author found exophthalmus. In all of them sometimes a past and sometimes an active neuritis optica. In a few cases the optic papilla was entirely white and atrophic. In two cases the intelligence was under normal, in 3 cases rachitis existed and in 3 difficulty of speech.

Optic nerve atrophy in oxycephalus is generally to be referred to a previous existing meningitis, (Virchow).

Maur states that following an interruption of the process of ossification an osteitis develops much later ends with with a pachu- and lepto-meningitis. The author remembers that we know of two favorable and *quoad vitam*, benign, forms of meningitis—meningitis chronica simplex and miningitis serosa (in other words Hydrocephalus internens). These two forms of meningitis combine many times in such a way that it can not be differentiated which of them is the exact cause of the optic nerve atropy.

But few pathologic examinations have been made in oxycephalus so the question is yet open for discussion. The author thinks that the most probable cause of optic nerve atropy is excessive amount of cerebro spinal fluid in the ventricles of the brain rather than inflammation of its membranes.

K. W. M. Translated by H. V. W.

REPORT OF A FUNDAL CONDITION SIMULATING DUPLICATION OF THE DISC.—SHERER, JOSEPH W., Kansas City, Mo. (*American Medicine,* Nov., 1908). The author's case was that of a man aged 42, presenting the appearance in the right fundus of two optic discs partly overlapping each other. Careful study of the minutiae of the case led him to believe it to be a case of abherrant growth of medullary merve sheaths. "This condition is only moderately rare in man, while in some lower animals it is very frequent and in others, notably the rabbit, it is constantly and normally present." It may be confused with areas of chorio-retinitis, of fatty deposits, or of albuminuric retinitis, but may generally be differentiated by its frayed or fringy edge. This character of the area of medullated nerves was absent in this case, also it was exceptional in that the disk did not have a reddish appearance in contrast with the area of medullated nerve fibres. These areas of medullated nerve fibres usually border upon the disk, but sometimes occur at other places in the fundus. Some authorities believe they do not affect vision, but the writer, with others, thinks they do. The author discusses the etiology of this condition in connection with the development of the optic tract.

M. D. S.

PSEUDO-OPTIC NEURITIS.—SCHNEIDEMAN, T. B., Philadelphia (*Ophthalmic Record,* Nov., 1908). In these cases the optic disc appears swollen and red and resembles in every particular a genuine choked disc, except that there are no retinal hemorrhages nor symptoms of intracranial disease. The vision is unimpaired, and the fields are normal. In the early stages of optic neuritis the vision is sometimes normal and may remain so for quite a period, but a time comes when it begins to fail. We also usually have evidences of the cause. In pseudo-neuritis there are no evidences of a cause, and the vision does not deteriorate. The cases of two sisters are reported which have been under observation for many years. In one eye of each of these girls there was a swelling of the discs of 2.50 D. with redness and obscured disc outlines with vessels slightly tortuous.

M. B.

IMPORTANCE OF DISEASE OF THE OPTIC NERVE IN THE EARLY STAGES OF MULTIPLE SCLEROSIS.—SCHLEG (*Wiener Klinische Rundschau*, Oct. 18, 1908). Affections of the optic nerve are in the opinion of the author quite frequent in multiple sclerosis; they make their appearance considerably earlier than any other symptoms of the disease.

In a young individual, in whom disease of the optic nerve is combined with symptoms of spastic paralysis, and when all these symptoms disappear suddenly more or less completely, in all probability we are dealing with a case of multiple sclerosis. J. G.

## PHYSIOLOGY.

REFLEX ACTION OF THE EYE ON CIRCULATION AND RESPIRATION. DISAPPEARANCE OF THE RADIAL PULSE AFTER PRESSURE UPON THE EYE.—ASCHNER, BERNARD (*Wiener Klinische Wochenschrift*, Oct. 22, 1908). Pressure on the eyeball in an insane individual in stupor, or upon the eyeball of a patient in deep narcosis, produce the same symptoms. In both cases the face becomes red, the patient begins to inspire deeply, becomes nauseated, opens his eyes for a short period, the pulse becomes very slow, and sometimes disappears entirely.

These symptoms show that we have to deal here with an irritation of the pneumo-gastric nerve. Such irritation can be produced in two ways: 1. By compression of the cerebrospinal fluid through the sheaths of the optic nerve, and, 2, by nerve reflex.

After experimentation with animals the author concludes that these symptoms are produced by reflex action, the centripetal nerve of the reflex arc is the trigeminus, and the centrifugal, the pneumogastric. J. G.

THE HYGIENE OF ILLUMINATION.—SCHANTZ (*Wiener Klinische Rundschau*, Oct. 11, 1908). In examining the different parts of the eye by transmitting ultra violet rays through them the following results were obtained:

1. Rays of less than 300 wave length could not pass through the cornea.

2. Rays from 300-350 passed the cornea, but were absorbed by the lens.

3. Rays 350-400 produced fluorescence of the lens and reached the retina.

Ultraviolet rays affect the eye in the following ways:

1. Irritation of the external parts of the eye, as we find it in electrical ophthalmia and snow blindness.

2. Changes in the lens, as observed in the destruction of the nuclei or cells of the epithelium of the capsule.

3. Irritation of the retina, as seen in erythropsy after long wandering on snow plains in the Alps, or after prolonged work near a mercurial light.

The rays therefore are injurious to the eye, and their removal in illumination is distinctly beneficial to that organ, and this can be be accomplished by employing a greenish yellow glass, because this glass has been found to absorb the ultraviolet rays. It is best to cover the light with this kind of colored glass. J. G.

### The Form and Magnitude of the Electrical Response of the Eye by Light at Various Intensities.—Einthoven, W., and Jolly, W. A. (From the Physiological Laboratory of the University of Leyden.) (With twenty-five figures in the text.)

Einthoven and Jolly (*Quarterly jour. of experimental Physiology.* Vol 1, No. 4) undertook a systematic investigation of the electromotive changes which are caused by stimuli of very varying strength. They employed frogs' eyes exclusively. They have been enabled on the one hand, by means of the string galvonometer which, for the retinal currents, may be regarded as the most sensitive instrument available (it has a latency of only 0.0001 sec.) to record and measure very weak electromotive forces, such as are evoked by light of extremely low intensity; on the other hand, they have tried by a suitable system of lenses to concentrate light of as great intensity as possible upon the retina of the eye under observation.

Conclusions:

1. The photo-electric reaction of an isolated eye is specially adapted to the study of the effect of stimuli of very different intensities. Light stimuli have been used whole energy varies from $3.05 \times 10^{-12}$ to $3.95 \times 10^{-2}$g. cal. per sec.

Short illumination with the strongest light has not been found to damage the eye, while the weakest light was capable of producing a fairly considerable photo-electric reaction.

2. The form under which the photo-electric reaction manifests itself under different conditions gives ground for the supposition that there occur in the eye three separate processes,

and each of these may be dependent upon a separate substance. We speak of three substances for the sake of convenience.

3. The first substance reacts more rapidly than the other two. On lighting it develops a negative, on darkening a positive potential difference. Its action comes strongly into prominence in a light eye and appears almost unmixed on sudden darkening of short duration (a flash of darkness).

The second substance reacts less rapidly than the first, and in an opposite sense. On lighting it develops a positive, on darkening a negative potential difference. Its action appears almost unmixed in a dark eye which is illuminated for a short time with weak light.

The third substance reacts in the same sense as the second, but much more slowly. Its action fails in a completely light eye, and also in a dark eye which is illuminated very weakly for a short time.

4. The latent period of the photo-electric reaction is in a high degree dependent upon the intensity of the stimulus. With strong stimuli it is of the order of 0.01 sec., while with very weak stimuli it may be lengthened to more than 2 sec. These values are in agreement with the latent periods of light perception in the human eye.

5. For each of the three substances the rule holds good that with moderate and strong light the energy of the stimulus increases much more quickly than the energy of the reaction.

6. Although the eye is much more sensitive than the most sensitive artificial bolometer, the energy of the reaction remains below that of the stimulus, even in the most favorable circumstances. The photo-electric recation of the eye is in this respect comparable with the action current of a muscle or nerve. E. E. B.

## REFRACTION AND ACCOMMODATION.

The Estimation of Errors of Refraction by Means of Astigmatic Charts.—Ellis, E. K., Boston (*Ophthalmic Record,* Nov., 1908). The use of cycloplegics becomes less necessary if refractive tests are made while the vision is fogged by plus lenses. The astigmatism is easily and accurately determined by the use of Verhoeff's astigmatic charts. The fogging should not be carried too far else the patient will not be able to distinguish between slight differences in the blackness of the lines on the astigmatic charts. Minus cylinders are used to equalize the lines on the chart, after which the strength of the fogging spheres is reduced until the vision is brought to the highest point possible. M. B.

THE RELATION OF HEADACHES TO ERRORS OF REFRACTION: A STUDY OF THREE THOUSAND CONSECUTIVE CASES FROM PRIVATE AND HOSPITAL PRACTICE.—BRAV, AARON, Philadelphia (*American Medicine,* Dec., 1908), emphasizes the importance of the study of relation of headaches to errors of refraction and disturbances of the muscular apparatus of the eye, since 60% of the patients consulting the ophthalmologist do so on account of headache. In making the therapeutic test of the causation of headaches by refractive error, he points out that in some cases where headache is due to ocular disturbance, some time may be required before the correcting glasses relieve it. He has seen no causal relation between migrain and errors of refraction. He believes that any error of refraction in migrainous patients should be carefully corrected with the expressed intention of removing any unnecessary nervous strain which is apt to produce reflex headaches, sometimes severe, simulating migrain, during the intervals between the migrainous attacks. He points out the ways in which the public are misled by the advertising optician, and the duty of the medical profession to remedy this evil by means of the press and by legislation. M. D. S.

EYES TO SEE.—HUTCHINSON, WOODS (*Woman's Home Companion,* Nov, 1908). The writer describes in his usual clear manner comprehensible to the layman, the emmetropic, hyperopic and myopic eye. He shows how the savage eye is defective, defines eyestrain, shows how glasses may remedy refractive errors, and points out the fallacy of the popular impression that "glasses weaken the eyes." M. D. S.

## RETINA.

RETINAL HEMORRHAGES AFTER EXTIRPATION OF THE THYROID GLAND.—BEST, F., Dresden (*Zeitschrift fuer Augenheilkunde*, xx, 1908, p. 548). After extirpation of the thyroid gland in man myxomatous swelling of the lids occurs as the only constant ocular symptom. In myxedema various diseases of the eye have been noted: parenchymatous keratitis, atrophy of the optic nerve, neuroretinitis, cataract, diplopia. B. observed in a woman, aged 43, after extirpation of a goiter, of which a remnant was left around the somewhat veiled disc of the left eye, several large hemorrhages and white foci encroaching upon the disc. Under thyreoidin 0.1 a day the hemorrhages were almost absorbed within 2 months. After further 6 months there was only a small streaky ecchymosis at the nasal side of the disc. An intercurrent administration of iodide of potassium was not well borne, as the swelling of the face increased. This was in accordance with the observations of Kocher, who found that iodide of potassium exerts a deleterious effect on the healthy remnants of the thyroid gland.

From the experimental arteriosclerosis produced by extirpation of the thyroid gland in dogs, sheep and goats, B. infers the dependence of the intraocular hemorrhages in his case upon this operation. As injection of thyroid juice accelerates the pulse and lowers the blood pressure and perhaps acts favorably on arteriosclerotic changes of the blood vessels, the author recommends thyroid tablets for the treatment of retinal hemorrhages, especially in glaucoma, in which favorable results from this substance have been recorded by Angelucci. B. warns however from too large doses, which may cause optic neuritis and atrophy of the optic nerve. C. Z.

FORMS OF RETINAL DISEASE WITH MASSIVE EXUDATION.—COATS, GEORGE (*Royal London Ophthalmic Hospital Reports,* Vol. xvii, part iii). The cases with which the present paper deals form, with other similar records from the literature, a fairly well-defined group. They are characterized by the presence in some part of the fundus of an extensive mass of exudation. In some instances very peculiar forms of vascular disease are also found. Inasmuch as the most careful physical examination commonly fails to discover any probable etiology, no certain diagnosis can usually be arrived at from the clinical standpoint. The records of pathological examinations in such cases are extremely scanty. This is an exceptionally well written and valuable pathologic article, fully illustrated with photographic reproductions of microscopic specimens.

The author's Summary and Conclusions are as follows:

There is a disease of the retina, hitherto insufficiently differentiated, which is characterized by the presence in the fundus of large masses of white or yellow exudation; usually there are also groups of cholestearin crystals and hemorrhage. The affection occurs in young people, most commonly of the male sex, whose general health is usually perfect. No definite connection with former illness can be established, nor does the family history as a rule reveal anything of importance. The commencement is commonly unnoticed, and the course very slow; in some instances the eye is eventually lost from detachment of the retina, secondary cataract, iritis, or secondary glaucoma; in other instances quiescence is attained before these results ensue.

In an allied form of the disease, or in a variety of the same form, strange types of vascular disease are found—fusiform and globular expansions, kinks, loops, glomeruli, etc.—as well as the more common types, such as constriction, white ensheathing, etc. The other characters of this group are similar to those of the first, but probably in consequence of the vascular disease the cases are less often quiescent, and are more frequently followed by the injurious sequelæ mentioned above.

In the only case of this disease which has so far been examined in a recent stage, the white-mass in the fundus was found to be due to a disintegrating hemorrhage seen through retina which was thickened and infiltrated with swollen leucocytes. The hemorrhage was connected with the outer strata of the retina, and was therefore presumably derived from the capillaries of the outer reticular layer, the most external layer in which capillaries normally occur; it had broken through into the subretinal space, and in its periphery slow organization was taking place. The chorioid had practically no share in the process. The opaque exudation seen in the fundus apart from the main mass was due to crowds of swollen leucocytes in the subretinal space.

In the subsequent course of the disease, as shown by the other, older cases, the process of organization is completed and cicatricial contraction sets in, crumpling up the retina and causing further detachment. The hemorrhage breaks down completely, and may be totally absorbed; more usually, however, a small cavity remains among the cicatricial tissue, filled with debris, cholestearin crystals, and calcareous particles. The disease is now obsolescent, except when vascular disease is present, and gives rise to new hemorrhages.

The exact significance of the vascular changes found in some cases is not yet fully made out. They occur in three chief forms: (1) Dilatation with little change in the wall. (2) Thickening of the wall with hyalin degeneration and nuclear fragmentation. (3) Collections of inflammatory cells in the wall and in the perivascular lymph spaces. Some, perhaps all, of these changes are probably secondary (*a*) to obstruction caused by cicatricial contraction, and (*b*) to the action of low grade irritants, such as are always produced by disintegrating blood, constituting the stimulus to the surrounding tissues, which result in the chronic inflammatory process known as organization. On the other hand, it is possible that some of the vascular changes are primary and the cause of the hemorrhage; but against this explanation are to be set the youth of the patients, and the fact that the disease is commonly unilateral. Other possible explanations of the hemorrhage are: hemorrhage at the time of birth, hemorrhage due to constitutional conditions, perhaps associated with alterations in the coagulability of the blood, and perhaps, in exceptional cases, hemorrhage due to strain and injury. It is probable that no single hypothesis will cover all the cases.

There is another form of disease, also with massave exudation in the retina, which is characterized by the formation of arteriovenous communications, with enormous enlargement of the affected vessels. In the youth of the patients attacked, in the absence of an evident etiology, and in its general course and termination, it has many points of resemblance to the cases already mentioned, and possibly it is allied. But the few pathological examinations which have been carried out do not altogether support this, but speak rather of a true vascular new formation in the retina. In the meantime, therefore, it is better to classify them separately. H. V. W.

## SINUSES AND NOSE.

ACCESSORY SINUSES AND EYE DISEASES.—HOLMES, C. R., Cincinnati, Ohio (*Laryngoscope,* Nov., 1908). The writer gives credit to Zuckerkandl for the anatomy of these cavities. In speaking of the sphenoid cavity he emphasizes the fact that the size and thickness of the walls vary in different cases and that there is no way of determining this before operation. Great caution should be therefore used in operative procedures. He believes that 10% of cases are due to dental caries: the balance to the exanthemata, (Harke) lobar pneumonia, meningitis, acute pericarditis. (Darling.) In 37 cases out of 52 autopsies, one or more of the sinuses were found to be affected. He believes influenza to be the antecedent of cases where the pneumococcus is the offender.

H. attributes the infection in cases of erysipelas to the sinus. (The reviewer believes that the majority of cases can be traced to the sinus, although during the past month he has seen one case where the sinuses were not involved.) He believes in the Belton Massey method. He, however, does not state whether there has been a recurrence or foci stablished in other parts of the body.

Belton Massey method. Use hollow gold electrodes filled with mercury (metallic) or zinc electrode, amalgamated at the moment of using with suphuric acid and mercury. Use 400-1000 M.A. and 50-75 volts. The author's point is well taken when he says that we should operate only when the acute symptoms have subsided (as in appendicitis). The reviewer believes that the vast majority of cases will get well by appropriate treatment to the sinuses and that many deaths may be traced to hasty operation. An excellent table of the symptoms of the various sinuses and the blood supply of the sinus regions and the adjacent area is accurately condensed, accompanies the paper. A. M. MACW.

TO THE KNOWLEDGE OF ATYPIC FORMS OF MUCOCELE. INTERMEDIATE AND EXTERNAL MUCOCELE OF FRONTAL SINUS. —CALDERARO, S. (From the eye clinic of Prof. Cirincione in the University of Palermo, *Archiv fuer Augenheilkunde,* lxi, p. 331). After a review on mucocele of the different accessory sinus of the nose from literature, especially the investigations of Cirincione, C. reports in detail 2 cases of atypic forms of mucocele of the frontal sinus which were operated upon at the clinic of Prof. Cirincione, and gives abstracts from similar cases published. His conclusions are: Atypic forms of mucocele of the frontal sinus may occur, which are caused by the abnormal anatomic configuration of the sinus and are difficult to diagnose. This may consist in (a) an appendix of the frontal sinus in the outer portion of the orbital vault and may extend backwards to the small sphenoidal wing, (b) the extension of the frontal sinus above the orbit to the optic foramen, (c) in an accessory cavity in th eouter portion of the frontal bone. As long as the osseous wall is destroyed the symptoms are those of an orbital, retrobular tumor, or a tumor of the optic nerve, viz., exophthalmus forward, downward and outward, or inward; impossibility of receding of the eyeball into the orbit; uniform diminution of the excursions of the globe in all directions, amblyopia or amaurosis; hard (osteophytic) protuberances at the surface of the intumescence, generally retrobular. The treatment consists in emptying the contents of sinus, resection of the swollen orbital vault and the rudimentary septa and obliteration of the cavity of the mucocele. This is effected by careful removal of the whole mucous membrane with the rongeur, cauterization with chloride of zinc (1.10) and daily tamponade with gauze impregnated with tincture of iodin, for 5 minutes, to promote free development of granulation. If the cavity is nearly filled in, subcutaneous tissue is grafted, to avoid sinking in of the superciliary regin. The cure requires from 3 to 4 months, but is complete. Nineteen photogravures of cases and anatomic specimens illustrate the conditions. C. Z.

ON RHINOGENIC OPTIC NEURITIS.—PAUNZ, M., Budapest (*Archiv fuer Augenheilkunde*, lxi, p. 369). It is a well-known fact that suppurations of the accessory sinus of the nose play the most important part in the etiology of orbital phlegmon, which may lead to inflammations of the optic nerve. It is, however, not sufficiently known that inflammations and suppurations of the posterior ethmoidal cells and of the sphenoidal sinus may, without orbital phlegmon, cause an inflammation of the optic nerve, especially of its portion in the optic canal. These relations have, within the last 4 years, been carefully studied at the clinic of Prof. von Groz, and P. reports in detail 6 such cases, which showed papillitis or retrobular neuritis or both. It seems that the suppurations of the posterior ethmoidal cells produce optic neuritis more frequently than empyema of the sphenoidal sinus. The inflammation most likely commences in the intracanalicular portion of the optic nerve from obvious anatomical reasons. As shown by Zuckerkandl and Onodi, the optic canal sometimes is enclosed in the sphenoidal or posterior ethmoidal cells, separated from them by a very thin osseous wall. The transmission may occur through physiological dehiscences of the bone or through circulation or the lymphatics by means of osteophlebitis, osteoperiostitis or osteonecrosis. As the periosteum in the optic canal is substituted by the optic sheath, which is a continuation of the dura mater, a very small quantity of pus, accumulated between optic sheath and bone, may cause a compression or inflammation of the optic nerve. This corresponds with the experience, that vision may fail rapidly within a few days. According to de Lapersonne the suppurations of the sphenoidal sinus produce more frequently edema of the optic nerve than inflammation. P. thinks that this may be the case if the affection commences and disappears rapidly without leaving ophthalmoscopic or functional disturbances, but if permanent lesions result an actual optic neuritis must be assumed. P.'s cases show that acute and chronic inflammations and suppurations of the posterior accessory cavities may create acute or chronic inflammation or collateral edema of the optic nerve. These may be monolateral, on the side of the nasal affection, or bilateral even in one-sided suppuration of the nasal cavities. Vision generally fails rapidly or is entirely abolished in the course of a few days, especially in acute cases.

The visual field also shows defects. Scotomas for colors were found in all his cases. Ophthalmoscopically there may be venous hyperemia, papillitis and descending atrophy or no changes. In each case the diagnosis of retrobulbar neuritis could be made from the observed symptoms. There were always pathological changes in the posterior ethmoidal or sphenoidal cells, generally pus. Its evacuation always, excepting one case, brought about marked improvement or complete recovery.

The prognosis is more favorable the more acute a case is. In those cases in which no pus was found but vision was restored, disturbances of circulation must be surmised, which were removed by the hemorrhage during the nasal operation. P.'s observations illustrate the importance of careful rhinological examinations in cases of optic neuritis. C. Z.

The Relation of Diseases of Accessory Sinuses of the Nose to Eye Symptoms.—Murphy, J. W., Cincinnati (*The Ohio State Medical Journal*, Jan. 15, 1909). From a series of answers to questions addressed to high authorities on this subject as Leber, Schmidt-Rimpler, Sattler and Axenfeld, in 1904, it is shown that up to that time "retro-bulbar neuritis and pressure atrophy of the optic nerve, where a causal connection was clearly established between the eye symptoms and an empyema of the accessory nasal cavities during the life of the patient, and later confirmed by necropsy, was rather rare." During the past year Dr. Henry Manning Fish, of Chicago, reported the study of thirty-six successive cases of optic neuritis, in which nasal accessory sinus disease was present twenty-six times. An analysis of these cases proves the correctness of Prof. Mandel's theory that most cases of unilateral optic inflammation are traceable to a nasal source. Lapersonne holds the same opinion, but both believe that the cause of double optic neuritis is generally some intracranial process. The author reports four cases in which the eye symptoms seemed to show a causal connection to a diseased accessory sinus. M. D. S.

Mixed Streptococcus and Pneumococcus Infections of the Orbit and Adjacent Sinuses.—Bull, Chas. Steadman, New York (*Ann. Ophthal.*, Oct., 1908). Six cases are reported of abscess formation at the apex of the orbit, in all of which there were acute local inflammatory symptoms, such as swelling of the eyelids and chemosis. The temperatures were essentially septic. Several of the cases were in stupor for several days. Pain was very pronounced in all cases.

Evacuation of the pus was accomplished in all cases, and curettment of the nasal sinuses was performed through the orbital route. The cases all made satisfactory recoveries. (We judge by the description of the cases that the sinuses causing the apical orbital abscesses were the posterior ethmoidal and sphenoidal.) The pus in all the cases showed almost pure culture of streptococci and pneumococci. M. B.

OCULAR AFFECTIONS ASSOCIATED WITH DISEASE OF THE SINUSES CONTIGUOUS TO THE ORBIT.—RISLEY, S. D., Philadelphia (*Ann. Ophthal.*, Oct., 1908). Three cases are reported. The first case suffered from pain in the head which was not relieved by the correction of a high error of astigmatism. Shrinking of the middle turbinates from cauterization entirely relieved him. The other two cases were attended by orbital abscesses, one of which was operated upon through the orbit, the nasal sinuses being curetted through that opening. The other was operated upon through the nose, and drained. In these two cases vision was greatly reduced, but came up to normal after the nasal sinusitis and orbital abscesses were cured. M. B.

THE RELATION OF DISEASES OF THE NOSE AND NASOPHARYNX TO AFFECTIONS OF THE EYE.—ONODI, A. (*Pester Medizinische Chirurgische Presse*, Oct. 4, 1908). In 15 cases the author found the canalis opticus communicating freely for 6-8 and 10 mm. with the posterior accessory sinuses. The semicanalis ethmoidalis is of great importance, in this respect, because it communicates freely with the ethmoidal cells, and contains veins, which are only covered with mucous membrane; this mucous membrane, on the other hand, is in contact with the orbital periosteum and the dura mater. The formation of the canalis opticus and location of the optic nerve are very often responsible for the venous stasis of the optic nerve, and for the extension of the inflammatory process. J. G.

## SYMPATHETIC OPHTHALMITIS.

THE PATH ALONG THE OPTIC NERVE IN SYMPATHETIC OPHTHALMIA.—LIMBOURG, PH., Coeln (*Archiv fuer Augenheilkunde,* lcii, p. 82). On one eye of a man aged 40, exenteration was performed and the wound sewed with catgut. After 12 days he became very much excited, had a drowsy feeling and complained of very distressing photopsia and photophobia in the other eye. The wound was opened and pus evacuated, and the subjective phenomena disappeared. V. and ophthalmoscopic condition were normal. L. considered this as sympathetic neurosis, due to an affection of the optic nerve. The first optic nerve and its propagation into both optic tracts still functionated. Through the operative removal of retina and uvea with the sharp spoon the microorganisms gained access to the optic sheaths and between the optic fibres. They reached, at the chiasm, the optic nerve of the other side and caused here, as one must suppose, disturbances (photopsia and photophobia), that a direct irritation of the 2nd optic nerve. Twelve days sufficed for the migration. L. is inclined to call the affection sympathetic retrobulbar neuritis. Thus sympathetic ophthalmia and cases described as sympathetic neurosis would be much more closely related and be dependent upon a lymphangitis of the optic nerve starting from the infected eye.

For the experimental proof of the transmission through the optic nerve, L. injected cultures of very virulent bacilli, from a case resembling noma, into the vitreous of one eye of each of 2 rabbits, followed by tonic and clonic convulsions. After 2 days one animal died, the other was killed with chloroform, and immediately cultures from the blood of the heart and from the surface of the very hyperemic brain were made. Both cases yielded the same results. The culture soils of the blood remained sterile, the culture from the brain substance contained the same kind of bacilli which had been injected into the eye. Serial sections of the optic nerve showed a continuous intense infiltration of the optic sheath from the eye to the brain. The bacilli apparently had wandered on this path from the vitreous to the brain and had caused a meningitis. The transmittance through the blood is excluded, as this was free from bacilli. L. thinks that his experiments greatly support the optic nerve theory of sympathetic ophthalmia. C. Z.

Sympathetic Ophthalmia Occurring Thirty-One Days After the Removal of the Injured Eye.—Mathewson, Geo. H., Montreal (*Ophthalmic Record,* Nov., 1908). Man of 42. Left eye penetrated 21 years ago by flying particle of brass. History of previous attacks of corneal ulceration resulting in corneal staphyloma and finalyl in panophthalmitis. Enucleation was performed. Thirty-one days later the fellow eye was attacked with an anterior uveitis. The treatment used was mercurial inunctions and pilocarpine with local use of atropine. Hot baths were soon substituted for the pilocarpine. A perfect recovery followed. M. B.

Sympathetic Ophthalmia Following Mules' Operation.—Brobst, Chas. H., Peoria, Ill. (*Ophthalmic Record,* Nov., 1908). The eye of a boy was destroyed by an extensive cut with a knife, and 10 hours after the accident a Mules operation was performed. Sixty days later he developed sympathetic optic neuritis. The stump of the exciting eye was painful to touch and congested. It was enucleated and deep injections of cyanide of mercury were made into the stump of the optic nerve and this was repeated three days later. The sympathizing eye made a speedy recovery. M. B.

Clinical History and Histologic Study of a Case of Transferred Ophthalmitis Following the Insertion of a Gold Ball Into the Scleral Cavity.—Enucleation.—Recovery With Useful Vision.—Oliver, Chas. A., Philadelphia (*Ophthalmic Record,* Nov., 1908). A middle-aged miner lost an eye from a penetrating wound of the cornea from a piece of coal. A Mules operation was performed. Seven weeks later a typical sympathetic inflammation developed in his other eye. The offending stump was enucleated and the patient put upon the sodium salicylate treatment. He recovered with iritic adhesions and cataract. A preliminary iridectomy was performed and the lens was removed two weeks later. The patient regained useful sight. An examination of the enucleated stump did not reveal the presence of bacteria. The sclera was found to be much thickened and its tissues infiltrated with leucocytes. The optic nerve was much swollen and its fibres atrophic. It was thickly infiltrated with leucocytes. The sheath was thickened and the lymph spaces packed with mononuclear leucocytes. The central artery was plugged with leucocytes. M. B.

On Sympathetic Ophthalmia After Evisceration and Mules' Operation, With Report of a Case.—Gifford, H., Omaha (*Ophthalmic Record,* Nov., 1908). A man of 45 sustained a penetrating wound of sclera from a sunflower stump. A Mules operation was performed six weeks later. The glass ball was introduced through a scleral wound, the cornea being left in place. Six months later he developed an active sympathetic inflammation of the usual type. There were no signs of irritation in the exciting ocular stump. It was enucleated at once and the patient placed upon the sodium salicylate treatment and he made a splendid recovery. Eighteen months later he had an attack of acute glaucoma. Iridectomy reduced tension and improved sight. Six months later tension went up again, when a sclerotomy was performed. Three months later another sclerotomy was performed, but the eye remained congested, and a solid immovable exudate collected in the anterior chamber, and the lens gradually became opaque. In spite of all treatment the exudate increased and the cornea was nearly all of a yellowish hue. The globe became small and soft, with doubtful light perception. Gifford has collected all the cases reported of sympathetic inflammation which have followed Mules' operation, 14 in all, 9 after ordinary evisceration, and 3 after Frost's operation. He mentions incidentally that 35 cases have followed enucleation. A study of the cases presented suggests the possibility of many of them being coincident diseases of the unoperated eye. Credit is given to removal of the supposedly offending stump when the seeming sympathetic process in the other eye possibly would have recovered under the treatment used without this surgical interference. M. B.

Post Operative Sympathetic Ophthalmitis.—Campbell, Don M., Detroit (*Ophthalmic Record,* Nov., 1908). Post-operative sympathetic ophthalmia is not an extremely rare occurrence. 2nd. There is a special anatomic pathologic condition, the occurrence of which in an injured eye will surely produce sympathetic ophthalmitis in the other eye. 3rd. The search for a special route of passage from one eye to the other is fruitless and unimportant. 4th. The evidence of a general systemic infection being at the bottom of the difficulty is fairly conclusive. 5th. There is a train of symptoms—objective and subjective—which are fairly convincing of the immediate probability of an impending sympathetic ophthalmitis; there are violent inflammatory disturbances in the injured eye accompanied by the evidence of infiltration in the uveal tract; clinically this is best shown by muddiness, thickening of the iris and tenderness over the ciliary region, great pain, a prickling or numb feeling over the distribution of the ophthalmic division of the fifth nerve, especially the supra-orbital branch. Constitutional infection, such as general depression, malaise, loss of appetite, moderate elevation of the bodily temperature and pulse rate, and later on the well-known signs of inflammation in the fellow eye. 6th. The result of modern methods of treatment is much superior to that employed fifteen years ago. Six cases are reported, in three of which sympathetic inflammation developed in from 3 to 4 weeks after operative procedures upon the eye which involved opening the anterior chamber. In the other three cases, two followed enucleation after an interval of three weeks and one followed a Mules operation in a child after an interval of 3 years. The first two cases were treated by mercury and terminated badly. The other four were given heroic doses of sodium salicylate after the method of Gifford and all made perfect recoveries.

M. B.

REPORT OF TWO CASES OF SYMPATHETIC OPHTHALMIA.—THOMPSON, EDGAR S., New York (*Ann. Ophthal.*, Oct., 1908). A man of 71 years developed a pseudo-membranous conjunctivitis. The cornea became necrotic early, the cornea cicatrized with the iris included in the scar. Three months later he developed sympathetic inflammation in the other eye. The exciting eye was removed. Under large doses of aspirin he made a splendid recovery with normal vision. The second case was in a man of 62 years who had his eye injured in a fight by a finger thrust. Severe kerato-hypopyon followed with corneal ulceration. Saemisch section was performed. The eye finally healed with a large corneal cicatrix which included the iris. In two months' time he developed sympathetic inflammation. The exciting eye was removed. Under mercurial inunctions and large doses of aspirin he recovered with V=20/xl. The author emphasizes the importance of keeping such patients in bed with eyes bandaged. Atropin should be used in moderation.

M. B.

## TOXICOLOGY.

On Ocular Changes Caused by Dimethyl Sulphate.—Erdmann, P. (From the eye clinic of Prof. A. Peters in the University of Rostock, *Archiv fuer Augenheilkunde,* lxii, 1908, p. 178). The toxic properties of dimethyl sulfate [SO2(OCH3)2], an oily fluid which nowadays is much used in manufacturing methyl preparations, have been carefully investigated in 1900 by Weber (Archiv fuer exper. Pathol. & Pharm. 47, 1902, p. 113), at the instance of 3 cases of intoxication. E. reports a recently observed case of injuries of the eyes of a chemist from vapors of dimethyl sulfate. In the evening after working in a closed room for several hours, with dimethyl sulfate, the patient felt a burning in his eyes which, towards night, increased to intolerable pain, with lacrimation and photophobia. Both lids were swollen, ocular conjunctiva chemotic, and there was profuse watery secretion. Both corneæ showed under the loupe a fine diffuse opacity, which consisted of irregularities of the epithelium and spots pervading the whole thickness of the parenchyma and, the following day, had increased in density. This partially cleared up, from the 3rd day, so that after 2 weeks the patient could be dismissed with V. almost 5/v. The eyes remained without irritation, but at an examination 3 weeks later the central fine dotted opacity of the cornea had remained, even at the last examination, 7 months later.

To study the finer anatomical changes, especially of the cornea, E. made a number of experiments on rabbits and guinea pigs, which are reported in detail. Two methods were employed. In the first the animals were exposed to vapors of dimethyl sulfate under a glass globe, with one eye closed by lid sutures and plaster, in the 2nd an eye cup, which contained cotton soaked with from 20 to 25 drops of dimethyl sulfate, was firmly attached to one eye of the animal and winking prevented by a small clasp. After being exposed to the vapors for a certain time, the eyes were under proper preparation examined anatomically with the following results:

Dimethyl sulfate causes violent inflammatory symptoms on the eye of man and animals, which reach their acme within 29 hours with vesicular elevation of the epithelium and parenchymatous opacity of the cornea, and gradually subside. The opacity of the cornea consists in an edema of the parenchyma in consequence of a lesion of the endothelium, leading to hydropic degeneration and detachment of the endothelial cells. The vesicular detachment of the epithelium is produced by a transudation between the ground substance and the basal cells, which are shrunken and loosened by the vapors. The imbibition opacity of the cornea subsides with the regeneration of the endothelium, but a fine dotted parenchymatous opacity remains from slight inflammatory changes of the parenchyma. On account of the severe and obstinate inflammatory symptoms and the visual impairment resulting from the remaining cornea opacity the greatest care with regard to the eyes is necessary in working with dimethyl sulfate. The histologic changes are illustrated on 2 plates. C. Z.

## TRACHOMA.

Trachoma in its Sociological Aspect.—Stuart, Chas. C., Cleveland (*The Ohio State Medical Journal,* Dec. 15, 1908), describes the spread of trachoma throughout Europe by means of the Napoleonic wars. He gives the percentage of the total population of many countries having trachoma, from 6 per 1000 in England to 680 per 1000 in Roumania. In Austro-Hungary, from where in recent years our largest number of immigrants have come, the prevalence in various portions is from 10 per 1000 to 110 per 1000. The total number of immigrants in different years from several countries is given, and it may be observed that they are coming from countries showing the highest percentage of trachoma. Since 1897 the supervision of this immigration has been placed under the Department of Public Health and Marine Hospital Service and from statistics based on the reports of a number of ophthalmic hospitals for several successive years, the writer believes that with the possible exception of certain local foci of infection, the disease is not only held back to its own level but is actually being pushed down, this due to the work of the Marine Hospital Service. The work of Pfeiffer, Kuhnt, Mueller, Hess and Roemer in seeking the origin of trachoma is mentioned. M. D. S.

## TUMORS.

A Study of the Acquired Cysts of the Conjunctiva.—Cabannes (*Annales d'Oculistique,* Aug., 1908). Lagrange's classification of lymphatic cysts, glandular cysts and cysts by inclusion is adopted.

In the majority of cases lymphatic cysts are found on the inner side of the bulbar conjunctiva between the caruncle and the corneal margin, or in the cul-de-sacs.

Chronic conjunctivitis and purulent ophthalmia seem to be the most frequent causes of the affection.

These cysts are usually ovoid from four m.m to six m.m. long and from two m.m. to four m.m. wide. They are remarkably transparent and the conjunctiva is freely movable with them or above them. The neighboring ganglions are not usually involved. They cause no inconvenience except mechanically.

The epithelium that lines these cavities is flat and is one layer. Often there are several smaller cyst cavities in the neighborhood of the cyst.

Glandular cysts are found most frequently in the cul-de-sacs, though occasionally on the nasal side of the bulbi. Their cause is not known. Their size varies from that of a pin's head to that of an almond. Those of larger size are fixed in the cul-de-sac, while the smaller are subconjunctival and mobile. In some cases the conjunctiva that covers them is congested. They contain a clear or citron colored fluid in which leucocytes and alveolar cells are found.

Microscopical examination of the walls of these cysts shows that they originate in the glands of Krause or of Henle, or in the numerous conjunctival folds of the cul-de-sac. Generally the epithelium that lines these cavities is polymorphous and is stratified in two or three or more layers. Mucous degeneration of the superficial cells is often noted.

The pathology of glandular cysts is much discussed. It seems likely that chronic inflammation causes either an obliteration of excretory tubes or an abnormal proliferation of the acinous glands, or that an adhesion of normal conjunctival folds may end in the formation of a sort of closed cavities which become the origin of the cystic evolution. The influence of traumatism is probable.

Cysts by inclusion are very rare. They have their origin in accidental or operative wounds. They appear in from two weeks to three months after the injury. They vary in size from a pin's head to a bean. Cilia are sometimes found inclosed in them. The walls of the cyst are composed of fibrous and connective tissue covered with pavement epithelium in one or several layers.

The pathogeny of these cysts resembles that of epidermic inclusions of the skin or of mucous membrane, particularly of the tongue and buccal membrane, and of pearly cysts of the iris. G. C. H.

EPIBULBAR TUBERCULOMA (TUBERCULAR GUMMA OF THE BULBAR CONJUNCTIVA).—LAFON (*Annales d'Oculistique*, Aug., 1908). The classification of tuberculosis of the conjunctiva may be reduced to essential types—military granulation and lupus; but the author has observed a third form, and has collected other cases from literature, which cannot be included in these classes, and to which he has given the name of tbuerculoma of the conjunctiva; or rather of epibulbar tuberculoma, as the lesion is developed primarily in the loose episclearal connective tissue.

This lesion assumes an infiltrated form. There is a mass of various lymphocytoide elements, giant cells and fibro-blasts, for the most part altered and necrosed, and numerous patches of caseous degeneration. In connection with new capillaries, thrombosed as soon as formed, are found vessels with walls much thickened and affected with vegetating endovasculitis. The bacilli of Koch are rarely found.

The underlying sclerotic is, little by little, destroyed by infiltration of these tubercular lesions. The fibres are separated and disappear and the morbid tissue takes their place. When the destruction is complete the adjacent uveal tract is infiltrated, but the retina, slightly detached, is not invaded. When left to themselves the necrosed tissues are eliminated and the neighboring connective tissue elements proliferate rapidly to replace the loss of substance, or, if a perforation occurs, panophthalmitis from secondary infection may follow.

In sixty-eight per cent. of the cases the patients were less than twenty years of age, and forty-five per cent. of them had tubercular pulmonary lesions.

As to the primitive or secondary origin of the disease, the author is inclined to favor the latter, and believes that the Koch bacilli, derived from other organs, are arrested in the capillaries of the episcleral tissue.

The commencement of tuberculoma is insidious. The patient notices, usually by chance, that a patch of the bulbar conjunctiva is red and in the center of this hyperemic zone a little red nodule soon appears, situated from two m.m. to four m.m. from the limbus. There is no secretion or epiphora, but more or less pain; sometimes quite severe.

The nodule increases in size to that of a cherry stone and assumes a grayish color, the conjunctiva over it loses its mobility and the ophthalmoscope shows a chorioidal lesion in the region of the tumor.

While in conjunctival tuberculosis adenopathy is the rule, it is comparatively rare in tuberculoma.

In the usual form of tuberculoma the gummatous infiltration is localized, but there is another form, of which three cases have been reported, in which the infiltration extends over the whole bulbar conjunctiva, which has a lardaceous appearance and, in the region of the limbus, forms a raised band which encroaches on the margin of the cornea.

The diagnosis of tuberculoma should be confirmed by microscopic examination and inoculation.

The prognosis of the local affection is usually favorable, but for the general condition it is always grave, as epibulbar gumma indicates a tendency to diffusion and generalization.

The author thinks that enucleation will not prevent general infection even when the lesion appears to be clinically primitive.

After the tumor is shaved off with the bistoury, the sclerotic should be curetted until sound tissue is reached; unless the whole thickness of the sclerotic is involved, when penetration into the vitreous should be avoided. The wound should be cauterized. General treatment is, of course, important.

G. C. H.

PRIMARY EPIBULBAR MELANO-SARCOMA.—GROSS, JULIUS, St. Louis (*Ophthalmic Record*, Oct., 1908). The author believes that because a melanoma develops from a proliferation of pigment cells, the chromatophores, the growth should be called chromatophoroma. A case is reported of a young woman of 21 years who for six months had been developing a pigmented growth at the nasal limbus of the cornea. The growth was removed with a knife and its base curetted. Twenty months have elapsed without relapse. A second case is reported of a young woman of 22 years, who has a growing pigment tumor growing from the iris. It has been two years in developing, and is still small and is giving the patient no trouble, and she refuses operation. M. B.

EXTENSIVE SARCOMA OF THE BULBO-PALPEBRAL CONJUNCTIVA.—ROY (*Annales d'Oculistique*, Nov., 1908). Roy reports the case of a child, 6 years of age, with a tumor two c.m. in thickness, five c.m. in height, and seven c.m. in width, hanging upon the cheek from a pedicle connected with the upper cul-de-sac. The cornea and pupil were normal and the sight seemed to be as good as in the other eye.

The disease had commenced only a month before the patient was seen by the reporter.

Microscopic examination showed the growth to be a rapidly developing sarcoma.

The contents of the orbit, including the periosteum of its upper part, were removed, and six months later there was no sign of a recurrence. G. C. H.

ON CONJUNCTIVAL CYSTS AND PAPILLOMATA.—ALT, ADOLF, St. Louis, Mo. (*Amer. Jour. of Ophth.*, Oct., 1908). The writer alludes to the usual classification of conjunctival cysts into the more common forms, (1) lymphatic and (2) glandular, the less frequent variety, (3) cysts by inclusion, and the rare (4) cysts caused by entozoa. He gives brief histories of four examples occurring in his own practice.

The lymphatic cysts usually lie on the nasal side of the eyeball in the bulbar conjunctiva between the caruncle and the cornea or in the fornix; they start from lymphangiectasiae; they contain a clear, uncolored fluid in which a considerable number of leukocytes and especially lymphocytes are found; they are movable with the conjunctiva, round or ovoid in shape, rarely become sufficiently large to cause annoyance, and their removal by scissors is very simple.

The glandular cysts are found most frequently in the upper or lower fornix and rarely in the bulbar conjunctiva. Their size varies, but it is usually larger than that of the lymphatic cysts lying in the bulbar conjunctiva, because the glandular cysts are covered by the lids and are not observed so easily; they are also movable. They may be colorless or slightly yellow in appearance. They take their origin from Krause's glands or the so-called Henle's glands, and are probably due to inflammatory affections, perhaps to traumatism or possibly they originate from abnormal glands in the conjunctiva. The characteristics of their epithelium are that there are several layers of cells usually more cylindric near the base, more flattened toward the interior, while the interior of the lymphatic cysts presents an endothelial coat of flat cells occurring usually in one or two layers only.

Conjunctival cysts by inclusion are rare, always due to an injury or an operation, and show the same changes which we find wherever live epithelial cells have become enclosed in other tissue.

'Papilloma of the conjunctiva, like that of other parts of the body, consists of connective tissue papillæ containing blood vessels and covered with proliferating epithelium. These tumors presenting the well-known cauliflower-like arrangement are not very frequent in the conjunctiva. They seem to have a predilection for the nasal side, especially the plica semilunaris and the caruncle. They are prone to recurrence, and may assume the character of a true epithelioma and grow into the depth." C. H. M.

FIBROMA OF THE SCLEROTIC.—MOISSONNIER (*Annales d'Oculistique*, Dec., 1908). A tumor the size of a large almond was situated on the lower part of the globe. It was adherent to the sclerotic, and to the tendon of the inferior rectus, but not to the conjunctiva; and was encapsulated.

The micropscope showed it to be composed entirely of fibrous tissue. G. C. H.

THE SPONTANEOUS CYSTS OF THE IRIS: THEIR PATHOGENESIS AND DEVELOPMENT.—JUSELINS, E., Wyborg, Finnland (*Klinische Monatsblaetter fuer Augenheilkunde*, xlvi, 11, 1908, p. 300). After discussing the views of various authors on the subject, J. reports the following case: A kidney-shaped grey tumor occupied the temporal portion of the otherwise normal iris of the right ey of a boy aged 6 years. By focal illumination the tumor was recognized as a cyst with clear contents, from which dark brown bands spread upwards and downwards to the brown iris. The cyst extended from the limbus over the pupillary margin into the posterior pigment layer of the iris, aqueous was clear, cornea slightly opaque, corresponding to the tumor, there was slight pericorneal injection. In choloroform narcosis a section was made at the limbus and at the same time the cyst punctured. Its collapsed walls were grasped with forceps and cut off. Perfect recovery.

In the microscopic specimens 3 different formations could be distinguished: 1, a pigmented cyst starting from the posterior pigment epithelium of the iris, with which it was connected by a stilus. 2. A nonpigmented cyst surrounding the first, lined inside with stratified epithelum. 3. Smaller formations between the stroma of the iris and the pigment epithlium, consisting of epithelial cells of the same character as those of the nonpigmented cyst and containing products of degeneration.

J. concludes that, with great probability, the spontaneous epithelial cysts of the iris arise from the anterior stratum of the posterior pigment epithelium of the iris or, more closely defined, from remnants of the ectoderm, which during the embryonic period have not been transformed into muscles of the iris. These ectodermal formations remain latent, in spite of their congenital foundation, and for one reason or other these epithelial disseminations retain, at birth or at a farther advanced age, a greater vitality and develop into cystic tumors.

These nonpigmented tumors markedly differ from those originating exclusively from the posterior pigment epithelium of the iris and a transition of this pigmented epithelium into nonpigmented epithelial tumors of cysts can be distinguished, as to their origin and character, from the typical dermoids.

C. Z.

Intraocular Hemorrhage and Sarcoma of the Chorioid.—Reis, W. (From the Eyeclinic of Prof. H. Kuhnl in the University of Bonn. *Zeitschrift fuer Augenheilkunde*, xx, 1908, p. 311), reports and discusses in detail the clinical histories and histological conditions of 2 cases of simultaneous occurrence of intraocular hemorrhages, which governed the clinical picture, and a hidden tumor of the chorioid. The first was a melansarcoma of the chorioid and presented the aspect of hemorrhagic glaucoma. In the second a brownish mass at the lower ciliary region, which was taken for a tumor, proved to be a solid encapsuled blood coagulum. At the anatomical examination a melanotic tumor of the chorioid was found at the lower border of the disc.

While hemorrhages due to necrosis of the tumor have been frequently observed, cases similar to those reported by the author are rather rare, as shown by his review of the incident literature. Not in every case of hemorrhages occurring in chorioidal tumors, need be a casual connection between the two, as the hemorrhages may be due to traumatism or may be spontaneous on account of local frailty of the vessels.

The author warns against all explorative operations in supposed intraocular neoplasms, as they are apt to produce an extrabulbar propagation or general metastases, and advises enucleation of such, almost always blind and painful eyes. He emphasizes that in cases in which other certain symptoms of tumor are missing the apparently spontaneous occurrence of more extensive intraocular hemorrhages suggests the possibility of the existence of an intraocular tumor. The histological conditions are illustrated on 2 plates, and a bibliography of 36 numbers is appended. C. Z.

BILATERAL GLIOMA OF THE RETINA WITH NUMEROUS DISTANT METASTASES.—GARDINER, JOHN PATTERSON, Chicago (*Arch. Ophthal.*, Nov., 1908, xxxvii, 657), reports a case of bilateral glioma of the retina with metases in a child aged three and one-half years. The right eye had been enucleated for glioma and three months later there was a recurrence in the orbit, and a glioma present in the left eye. Both growths wre removed and death occurred a few months later.

Autopsy showed a large tumor mass involving the right side of the face and orbit, and a recurring growth in the left orbit; numerous tubors over the scalp which were firmly attached to the calvarium, and corresponding areas involved on the internal surface of the parietal and frontal bones. Section of the face and head showed an involvement of all structures, on the right side, from the scalp to the hard palate. The lymph glands of the neck were involved, and nodules were present in the plural cavities and on the periosteum of the vertebræ. Growths were found in the spinal canal and the testicles were involved. The periosteum, both internal and external surfaces, of the pelvic bones was involved, and growths present on the bones of the lower extremities.

Dr. E. V. L. Brown gives the results of macroscopic and microscopic examination of the enucleated eye ball.

W. R. M.

THE TUMORS OF THE EXTRINSIC MUSCLES OF THE EYE.—PASCHEFF (*Annales d'Oculistique,* October, 1908). Pascheff reports several cases and tabulates others from literature. He finds that they include sarcoma, cancer, benign growths and pseudo-tumors. G. C. H.

ANGIOMA OF THE ORBIT, WITH INVASION OF THE GLOBE ALONG THE CILIARY NERVES.—QUACKENBOSS, ALEX., Boston (*Ann. Ophthal.*, Oct., 1908). A man of 32 years gave a history of having had a few dilated vessels in the conjunctiva of the lower lid of left eye since infancy. The temporal portion of the ocular conjunctiva also showed the same condition. At the age of 12 the angioma suddenly increased in size, resulting in swelling of lower lid and exophthalmos. The process then remained quiet until he was 23, then the lower lid became more swollen. Electrolysis was used when another period of rest followed for 6 years, only to be attended with renewed activity. The swelling now extended to the upper lid and the eye was more proptosed, when difficulty in closing the lids was experienced. Gradual increase of symptoms continued until the cornea became ulcerated from exposure. Until this time the vision remained almost normal. The eyeball together with the tumor was removed, the entire mass being about the size of a goose egg. Nine months after the operation there had been no recurrence. An extended report of the pathological findings is presented by F. H. Verhoeff, his diagnosis being hemangioma of orbit. Invasion of ciliary nerves, sclera, chorioid and optic disc, suppurative keratitis. M. B.

PULSATING EXOPHTHALMOS DUE TO INTRA-CRANIAL HYDATID CYST.—DEMICHERI, Montevideo (*Annales d'Oculistique*, August, 1908). A healthy child, five years of age, awoke one morning with the left eye much swollen and unable to open it, but without pain. After the use of cold compresses for a few days, the swelling subsided but the ball remained a little bulging. When the patient was seen six months later, there was a slight ophthalmos which was not reducible by pressure and not diminished by compression of the carotid, but a pulsation synchronous with the radial pulse, disappeared when the artery was compressed.

A murmur was heard on auscultation of the orbit.

Nine years lated the exophthalmos had increased and the upper margin of the orbit was deformed and irregular, and there was a funnel-like depression in which a cyst could be felt to bulge when the patient strained. There were no cerebral symptoms; not even headache.

When extirpated the tumor was found to be filled with hydrated vesicles of various sizes.

The roof of the orbit and the frontal sinus had disappeared and the finger entered the cranial cavity, meeting with a great number of hydrated vesicles to which pulsation was communicated by the brain. The patient made a slow but complete recovery. G.C.H.

## VITREOUS.

HEMORRHAGES INTO THE VITREOUS BODY IN THE ADOLESCENT.—GEHRUNG, JULIEN A., New York (*New York Med. Jour.*, Dec. 19, 1908). The writer reports two examples of this sort and as a result of his observations and an examination of the literature on this subject formulates the following conclusions: "1. Hemorrhages into the vitreous body during adolescence is quite frequent ,and owing to the danger of recurrence, and tissue changes in the eye, in a dangerous condition, worthy not only of patient, careful, and exhaustive treatment after the occurrence, but also of prophylactic measures. 2. The too rapid development of children should cause solicitude. 3. Rapid changes of temperature and prolonged exposures to heat or cold are ætiological factors. 4. Menstrual disturbances, undue sexual excitement and abuse, cardiac disease, dyscrasis, malnutrition, errors of refraction, all causes of eye strain, hereditary diseases and tendencies, vascular diseases, anemias, abnormal (premature?) development, or malformations, all mental and physical causes of sudden and rapid fluctuations of the blood stream and tension are causative factors in intraocular hemorrhages. 5. The origin of hemorrhages may be from the retinal vessels or from the vessels in the region of the ciliary body, not from the sheath, etc., of the optic nerve. 6. Glaucoma is rather the result than a causative factor of these hemorrhages. 7. The treatment should be medicinal if possible, the knife to be used only as a dernier resort. 8. Attacks in women usually follow menstrual disturbances. 9. When there is a tendency to epistaxis and this suddenly ceases we have a danger signal of hemorrhage. 10. Males are more liable to intraocular hemorrhage than women, normal menstruation is seemingly a safeguard. 11. The age from puberty through womanhood, or manhood, is a danger period. 12. Anemic conditions are predisposing." *C. A. M.*

ENTOPTIC RESEARCHES INTO THE STRUCTURE OF THE VITREOUS.—BURDON-COOPER, J., Bath, Eng. *(Ophth. Review,* Dec., 1908*).* A great many methods may be employed for studying the entoptic field of vision, but the writer hit upon a simple modification of the microscope as a perfect entoptoscope: the removal of the high power objective from the nose piece and its turning upside down on the top of the eye piece, using a lower power as the objective. By means of the mirror below the stage a beam of light is thrown up through the condenser and objective, and an eye placed close to the inverted objective at the eye piece sees with great distinctness the different shadows familiar to those who have studied the eye in this way. By this method the amount of light which enters the eye can be varied by the diaphragm: this is important since the objects near the retina are best seen under good illumination, those situated in the anterior part of the eye best with feeble illumination, while for objects between these two extremes a progressively diminishing illumination is necessary.

Another extremely simple and effective method consists in making use of a small glass sphere, from 1 to 2 mm. in diameter, held close to the eye. This constitutes a lens of exceedingly short focus, and with a good source of light gives an excellent divergent pencil. The little device is easily made, by fusing one end of a fine capillary tube (made by drawing out a piece of ordinary glass tubing in the flame of a spirit lamp) until a small bead forms. We can increase the size of the bead at pleasure, by fusing more and more of the capillary tube, and the larger the bead the greater the illumination of the entoptic field.

At the first introduction to the interior of the eye in this way the apparently infinite number and variety of the shadows that may be seen is nothing short of bewildering, but after a little experience in the use of the entoptoscope we soon begin to distinguish between the different appearances and are able to group those which are similar, irrespective of size.

The writer describes and illustrates the appearance and nature of the various shadow-giving bodies. The shower of bright little spherical bodies, described by writers on entoptics as occurring in the vitreous, is explained by the effects of Meibomian secretion existing in the tear-film on the cornea. The strings of pearls described by Helmholtz as in the vitreous are situated close to the retina and move in the same direction as the eye, indicating that they are situated on the retinal side of the rotation centre. A fine mosaic appearance is attributed to a thin layer of fluid existing between the retina and the hyaloid membrane, and argues for a lymph space in this situation, since the elements in this mosaic move even when the eye is kept still, whereas the strings of beads in the vitreous are fixeed and present no visible movement apart from that occasioned by the movement of the eye.

The most conspicuous of entoptically perceived shadows are due to folds of the hyaloid membrane presenting the appearance of two dark lines bordering a lighted band. That these appearances are due to folding of a membrane must be evident to any who have seen them, as the folds which are produced by movement of the eye can be seen to become smoothed out and finally to disappear when the eye is brought to rest. The writer concludes from measurements and from the behavior of the shadows that they are produced by folding or wrinkling of that part of the hyaloid membrane situated immediately behind the lens, there being ample proof entoptically that this membrane extends behind the lens and does not stop short at its periphery as was formerly taught. The writer's investigations showed that the hyaloid canal, instead of being a canal of more or less uniform diameter from before backwards, widens considerably from the lens to the retina, so that it is roughly conical with the apex at the lens and the base near the retina. C. H. M.

## VISION AND COLOR VISION.

The Value of Photographs in Natural Colors in the Diagnosis of Anomalies of the Color Sense.—Raehlman, Weimar (*Die Ophth. Kl.*, Sept. 5, '08) points out that owing to the fact that in the Lumier autochrome plates we are able to secure red, green and violet filters we have in them an acute test for sub-normal color perception. All of the colors which the eye perceives in photographs taken with these plates especially the yellow and blues, are composed of a mixture of the three rays red, green and violet. Moreover the colors which are seen through the plates are physiologic colors and those which are the primary colors under all circumstances. Consequently these plates are adapted for determining the kind and degree of the defect. They present objects in the confusion colors of the color-blind and in the contrasts and intensities which are employed in the marine and railway service. The transparent photograph which is hung against a window pane can be used for accurate measurement in the equalization of the different confusion colors (which previously was only possible with the color top). They also serve to determine the threshold as compared with that of the normal eyes.

The examination is conducted as follows: The examining surgeon selects two points in the picture, which make absolutely the same impression as to light and color, to show the patient. The test apparatus consists of two parts. The first of three separate filters for red, green and violet and the second of a wedge of smoked glass working in a groove with a scale denoting the amount of light admitted when the color under observation is extinguished. A magnifying glass of from 50-100 diameters is placed over the spot and the filter for the color under observation is interposed and then the smoked glass is introduced until the color is extinguished. In this way, by means of the wedge photometer the intensity for all three colors, one after the other, may be equallized; and in this way, we have also estimated by per cent. the mixture of red, green and violet in the one and in what other mixtures the other confusion colors are united in the color sensations of color-blind eyes.

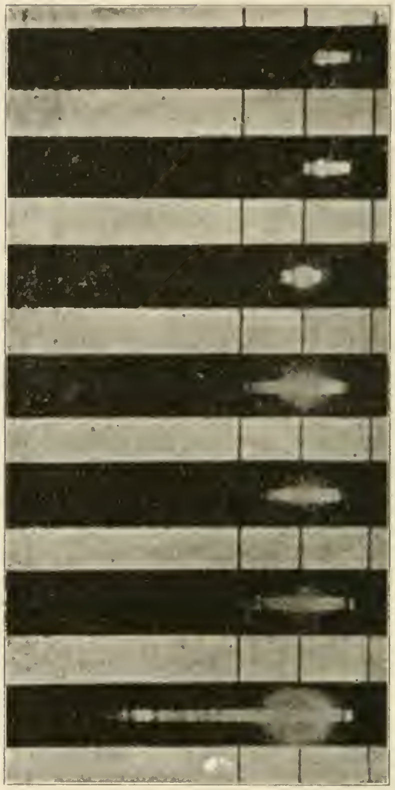
W. Z.

On the Disability of the So-called Anomalous Trichromates for Railway Service.—Schlodtmann, W., Luebeck (*Deutsche Medizinsche Wochenschrift*, 1908, No. 48, p. 2073), shows on a light case that persons who pass Holmgreen's test and make only slight mistakes in Nagel's test may not be able to answer all conditions required by the practical railway service at any moment. For such doubtful cases he recommends a practical test, on a ride on a locomotive, by an oculist in presence of a railway expert. S. considers Holm-

gren's skeins not sufficient for exact determination of color distinction necessary for railway service. Nagel's colored plates are much better for this purpose. Especially the ability, required by Nagel's method, to distinguish slightly saturated green from the various shades of gray, is of the greatest importance and absolutely necessary for the practical service.
C. Z.

INVESTIGATIONS ON HEMERALOPIA.—HESS, C., Wuerzburg (*Archiv fuer Augenheilkunde*, lxii, 1908, p. 50). Parinaud and his followers ascribed uncomplicated hemeralopia to an affection of the rods of the retina with preservation of the functions of the fovæ. As conclusions with regard to the nature of this peculiar affection cannot be considered of general value, as long as they are based only on the examination of certain kinds of hemeralopia, Hess laid especial stress on the study of all forms of hemeralopia so far known. He reports 10 cases of idiopathic, congenital and acquired, hemeralopia, or hemeralopia in retinitis pigmentosa, in diseases of the liver and in so-called spring hemeralopia, which were carefully examined with methods devised by himself. H. found in no case the area, devoid of rods, even approximately normal, but without exception diseased in the same sense as the extrafoveal retina. The general assumption, that hemeralopia be considered as a lack of visual purple, as the mediator of dark adaptation in the sense of Parinaud, is in contrast with all of H.'s observations. In all cases of hermalopia the area, devoid of rods, of the dark adapted eye was markedly less sensitive than in the normal eye. The very interesting and elaborate origin is highly recommended for a closer study, as H.'s exact investigations change the prevailing views on hemeralopia entirely. C. Z.

PROTECTING THE EYES FROM ULTRA-VIOLET LIGHT.—(*The Optical Journal*, Dec. 3, 1908). Schanz, a physician, and Stockhausen, a Doctor of Engineering, have been making some experiments on the passing of rays of ultra-violet light through various kinds of glass. The results have been published in various German papers, and have been translated and commented upon by a writer for the *Ophthalmic Review* as follows:



ABSORPTION OF LIGHT OF ELECTRIC ARC.

1. Open light, 5 sec. exposure. 2. Cyear globe, 10 sec. exposure. 3. Opal globe, 1 min. exposure. 4. Frosted globe, 5 min. exposure. 5. Red-violet glass, 10 sec. exposure. 6. "Euphos" glass, 10 sec. exposure. 7. "Euphos" glass, 20 sec. exposure.

The authors of this paper on ultra-violet light appropriately open the subject with an account of the personal experience of one of them of the effects of the ultra-violet rays on his own eyes. Dr. Stockhausen is a Doctor of Engineering, and in the course of some experiments on electric arc lamps he had occasion to watch the light almost uninterruptedly for half an hour. A few hours later his eyes smarted and he could not read the newspaper comfortably; the smarting increased, and the eyes became watery, red and swollen. During the night the discomfort was so great as to preclude all thought of sleep. In the morning the lids were glued together and opening the eyes was extremely painful. Examination showed the vision greatly reduced, and a small spot of "solarization" was visible in each retina, the evidence of which still hemains as a small rectangular cotoma near the fixation point.

A noteworthy point in the case was that the arc light used in the experiment was enclosed in a glass globe and that the observer in addition was wearing his spectacles. It was this fact that led the authors to the inquiry as to how far we are justified in the view that the ultra-violet rays are absorbed by ordinary glasses.

The first step was to determine the relative richness in ultra-violet rays of our ordinary sources of light. The eye of the observer is, of course, not an instrument which can be used for this purpose, but a photographic plate answers the purpose admirably. The prisms used for dispersing the rays were of quartz and the lens system consisted of achromatic combinations of quartz and fluor spar. Thirty-six sources of light were investigated.

The first illuminants in the series are the ancient Roman olive oil lamp, the sperm candle, stearin candle and the colza oil lamp; none of these show any ultra-violet rays. A very slight extension of the spectrum into the ultra-violet comes with the moderator lamp, the addition of a chimney giving improved combustion and a hotter flame; but all these lights, as well as the petroleum lamp and the fishtail and argand gas burners, may evidently for practical purposes be regarded as free from ultra-violet rays.

A marked change is seen when we come to the various incandescent mantle burners, whether the source of heat be gas, spirit or petroleum. All these show a distinct extension of the spectrum into the ultra-violet. The acetylene flame gives a spectrum of very similar character. Slightly longer again is the spectrum given by the ordinary electric light, and no obvious distinction is apparent between the carbon filament and the various forms of metallic filament lamps. The Nernst lamp, which can be used without a globe, shows in that condition a much longer ultra-violet spectrum than the rest; with a globe, it falls into line with the other incandescent filament lamps.

A further change in the type of spectrum appears with the electric flame or arc lamps. There is not only a further considerable lengthening of the ultra-violet portion, but the visible portion, instead of presenting as heretofore a fairly uniform band, now shows a tendency to fading away of the red end an a maximum of intensity situated about the junction of the visible and invisible rays.

Last in the series is the mercury vapor lamp. This very modern illuminant seems to be coming to the front and has been strongly recommended for workrooms, especially for those in which very fine work is to be done, its peculiar, almost mono-chromatic, light bringing out contrasts very clearly. Its visible rays consist chiefly of two brilliant bands in the blue-violet, its invisible spectrum is nearly five times the length of the visible one and shows many intense bands in its course.

The second section of the paper, which concerns the injurious influence of the ultra-violet rays on the eye, may be passed over briefly, for the authors contribute little to our knowledge of the subject. They repeated the experiments of Widmark, who found that of the two eyes of an animal exposed to an arc light, the one covered by ordinary glass and the other by a quartz plate, the former showed little change, while the latter developed electric ophthalmia; but by giving a prolonged exposure (four hours) to a light rich in ultra-violet rays they showed that even a thick glass plate was insufficient to prevent entirely the development of ophthalmia, although it delayed and mitigated its symptoms.

They suggest that the ultra-violet rays play a part in the causation of senile cataract, adducing the fact that the rays cause strong flourescence in the normal lens as evidence that they set up some change therein. But the fact that senile cataract most commonly exposed to light rays of any kind, is clearly a difficulty in the way of accepting this view.

In the third section the authors discuss the absorbtive powers of various kinds of glass for the ultra-violet rays. Taking those which are commonly used for the chimneys and globes of lamps they show, by another series of photographic spectra, that none of them have more than a very partial effect in absorbing the invisible rays; the spectrum is shortened as compared with that of the naked arc, but a light stil lrich in hurtful rays is transmitted by all of them. A densely milky glass seems to have been the most efficient of those tried; clear glass, even when used in a thickness of 18 mm., was ineffective; nor does it appear that lead glass, even of the very heavy type that is used as a protection from X-rays, is any more opaque to the ultra-violet rays than ordinary glass.

Of the tinted glasses used for protective spectacles, the long-used and still popular blue glasses allow the ultra-violet rays to pass with great freedom, even in the deepest tints. "Bleu ardoise" and "rosalin" are also quite permeable to these rays, and the same may be said of the lighter tints of "smoked" glass, Nos. 2 to 4; it is only when the very deep tints, Nos. 7 or 8, which may almost be called black, are employed that a very marked shortening was obtained, and even then not a complete disappearance, of the ultra-violet spectrum. Yellow glasses are dismissed in a couple of lines, as "somewhat shortening the ultra-violet spectrum," but examination of the two spectra given would lead one to think that the reduction produced by the yellow glass was decidedly more definite than that of any of the previously mentioned tints.

A glass which may be described as of a "greenish-yellow smoke" tint was produced by Fieuzzal, in France, 20 years ago, after observations on the effect of colored light on the pigment movements in the retinal cells. Though not specially designed as a protection from ultra-violet rays ( whose harmful influence was not then recognized) it appears from the spectra here given to be very fairly efficient in this respect. Another glass of very similar character is on the market under the name of "enixanthos" glass. To both of these, however, the objection applies that it is only when the tint is of such a depth as would preclude its employment for ordinary purposes that complete exclusion of ultra-violet rays is obtained.

Extensive trials of glasses of all colors and from various makers led the authors always to the same conclusion, viz.: that no glass commercially obtainable could be relied on to do more than cut off the rays of shortest wave length, or under 300 mm. But these cannot be regarded as the only harmful ones, perhaps not even as the most harmful; it has been shown, for instance, in the use of ultra-violet light in dermatology, that while the rays of shortest wave length are especially liable to cause superficial dematitis, the deeper effects are more readily obtained from the rays of greater wave length, 400 to 300 mm.

The authors therefore undertook practical experiments in the making of glass on their own account, and after numerous attempts, which at one time seemed likely to prove fruitless, they succeeded in producing a glass completely impervious to the ultra-violet rays. To this they have given the name of "euphos" glass.

They reproduce a number of spectra showing complete absence of the ultra-violet rays from various sources of light when these are screened by globes of ouphos glass, the most severe test being a five minutes' exposure to a 10 ampere arc lamp covered by ouphos glass eight-tenths of a millimeter in thickness ;even in this case there is no trace on the plate beyond the limits of the visible spectrum.

Euphos glass has had a light yellow-green color, butu the authors expressly state that it is not from its color that it derives its peculiar property of absorbing the ultra-violet rays. The illuminating rays are only slightly reduced by it, namely, to an extent of not more than 5 per cent. with glass of .5 to 1 mm. thick.

The importance of such an investigation as this is obvious. The tendency of all modern improvements in artificial lighting has been in the direction of producing more light for less expenditure of energy, and this has always been accomplished by a raising of the temperature of the glowing body to a higher and higher degree. But therewith has been introduced in ever increasing proportion the undesirable element of the more refrangible rays; until at least we are obliged to recognize that our most economically efficient source of light, the electric arc, is quite unfit for the human eye to work with. If a simple means could be found of ridding such lights of their hurtful elements a great step would have been made.

We are bound, however, to point out that the investigation here described seems to us open to criticism from two points of view. Firstly, the comparison of the spectra which forms the basis of the inquiry is vitiated by the fart that there is no real attempt to reduce them to a common quantitative standard. For example, in the first 20 spectra a uniform exposure of 10 minutes, duration was given, while the luminosities varied from less than one candle power in the oil lamp to 77 candle power in the incandescent gaslight; to make the comparison of any practical value the lights should obviously have been reduced to a uniform luminosity per unit area.

The second criticism is of a different nature. The authors give us no indication whatever of the composition of the glass which they have invented; indeed they tell us plainly that it is to be fully protected by a patent; and without going so far as to imply that this may have influenced them in their interpretation of facts, we think it is to be regretted that the well-established rule which states that a medical man ought not to be concerned with any secret remedy should have been departed from in this instance. H. V. W.

## VISUAL FIELD.

The Diagnosis of Central Color Scotoma by the Aid of Three Identical Simultaneous Objects.—Holth (*Annales d'Oculistique,* September, 1908). The apparatus (*chromotoscometre*) used by the author, consists of an ebony plate sixteen cm. long and two cm. wide, in which, four cm. apart, are three red objeects, ten mm. in diameter on one side of the plate and five mm. in diameter on the other side. The colored objects are formed by filling in depressions in the plate with sealing wax and polishing it down to a surface even with that of the plate. This is easily kept bright by washing with soap and water.

The scotometer is held horizontally thirty cm. before the eyes of the patient, who sits with his back to a window and fixes the central object. In the early stages of alcohol or tobacco amaurosis the object on the temporal side is more or less decolored. When the scotoma is absolutely central the middle object is decolored. In the paracentral scotoma of the later stages of tobacco amaurosis the middle object is affected as well as the temporal one. In the case of red-green color-blind patient, bluish grey was used for the color objects.

G. C. H.

## Book Reviews.

**Diathesis and Ocular Diseases.**— Ramsay, A. Maitland, M.D., Fellow of Faculty of Physicians and Surgeons, Glasgow; Ophthalmic Surgeon Glasgow Royal Infirmary; Lecturer on Eye Diseases, Queen Margaret College, University of Glasgow; Author of "Atlas of Ext. Dis. of the Eye," "Eye Injuries and Their Treatment," Etc. London: Bailliere, Tindall and Cox, 8 Henrietta Street, Covent Garden. Pages, viii. 184. Illustrations, 7 plates. Size, Crown 8vo. Price, 3/6 net.

This small volume of 184 pages of large, clearly presented type and seventeen beautifully reproduced plates mostly from photographs, will afford to every reader, be he specialist or general practitioner, a mental treat of a rare type. In addition to a most pleasant and lucid style of writing a certain novelty in the manner of considering certain eye affections makes the work particularly attractive. With our refraction mirrors, direct ophthalmoscopic examinations, corneal magnifiers, staining, magnets and microscopes, we tend to consider our treatment too much from the scientific aspect to the detriment of the "art" side, as the author tersely expresses it "be remembered that the treatment of disease is an art as well as a science," and in the introductory devotes his arguments to this point.

The author considers the subject of diathesis from these main points (1) the Neurotic, (2) the Scrofulous, (3), the Arthritic (a) gouty, (b) rheumatic and in a short chapter devoted to each describes each type. In the succeeding chapters he deals with the clinical aspects of inflammation of the conjunctiva, sclerotic, of the uveal tract, iritis, chorioiditis, iridochorioiditis—of the retina and optic nerve—hemorrhagic retinitis, albuminuric and glycosuric forms, also toxic amblyopia and retro-bulbar neuritis and glaucoma. Seeing, then, that these subjects are dealt with from the point of diathesis and the experience of a large clinical practice is incorporated in the methods of dealing with them, it is not surprising to find many new and interesting features on almost every page, making the whole work one of very great value to both the expert and the novice. It is a work which will recommend itself and like "good will require no work."

A. Allison Bradburne.

**Retinitis Pigmentosa with an Analysis if 17 Cases Occurring in Deaf Mutes.**— SHOEMAKER, W. T., and SWAN, JOHN W. With three colored plates; 100 pages. Price, $2.50.

The author deserves credit for the thoroughness with which he has reviewed the statistics of previous investigaters. Chapter 1 deals with the history and pathology of this disease, from references of about 100 other authors. The author wishes to establish the fact that the pigmentation occurs secondarily and if cases be examined after several years it will be found where it has not previously existed. One of his 17 cases was of this nature. In the deaf mutes a thorough examination was made of each case, including the history, the external appearances of the eye as well as the fundus and refraction. He found that refractive errors and the conditions of the blood did not bear any relation to the amount of chorio-retinal change.

The author believes that among the etiological factors that should be considered, maternal impression is a potent factor (sic!) In 15.3 per cent. of his cases consanguineous marriages were demonstrated. Posterior polar cataract, which is so often referred to in this disease, was not present in a single case. It is to be regretted that his investigations failed to throw any new light on the theurapeutics of the disease. He says: "The victim of retinitis pimentosa if he lives his allotted time of three score years and ten, will in most cases be blind." The reviewer considers that the results in treatment of cases with vibratory massage and electric current, are such, that further trial is warranted, especially when cases are seen early; this the more so in view of the fact that the author is so pessimistic.

The tables of the blood and urine analysis are given of these cases and a bibliography of 98 number is appended. The paper and print is very good, unusually large type being used.

The book is a useful edition to the oculist's library for the pathology and bibliography which it contains, as well as the most excellent cuts. A. M. MACWHINNIE.

**The Congenital Anomalies and Diseases of the Eye.**— PETERS, ALBERT., Professor and Director of the Eye Clinic in the University of Rostock. 262 pp. with 16 illustrations in the text and one plate. Bonn. Friedrich Cohen. 1909. 7M. $1.75.

The object of the author was to give a complete treatise on all the congenital anomalies and diseases of the eye of the new born, which has been wanting, as the so far extant publications dealt chiefly with the malformations. He also included some disturbances developing later but due to heredity, as hereditary atrophy of the optic nerve and amaurotic idiocy, a chapter on congenital inflammations and injuries at birth.

The whole is preceded by 11 pages on anatomical and physiological peculiarities of the eye of the new born, by which it differs from that of the adult.

First, the single forms of coloboma are described clinically and anatomically, with a discussion of their pathogenesis, according to the most recent investigations of Hess and von Hippel, which did away with the influence of fetal inflammations and gave a uniform explanation from disturbances of the closure of the ocular fissue by mesodermal formations.

Then the malformations of the eyeball are considered, as cyclopia, microphthalmus, anophthalmus and the cysts of the globe associated with them, and the various congenital anomalies of the single parts of the eye and its annexia. Of special paragraphs may be mentioned those on hydrophthalmus, congenital pigment anomalies of the eye, as albinism, heterochromia of the iris and abnormal pigmentations in the eye, heredity of cataract, therapy of congenital and infantile cataracts and of ectopia and dislocation of the lens; under corneal anomalies of the vascular system: tortuosity of the blood vessels and psuedoneuritis, vortex veins at the posterior pole, under diseases of the orbit: encephalocele of the orbit, congenital exophthalmus and teratomas of the orbit; under congenital disturbances of motility of the eyeball: congenital ptosis, abnormal movements of the lids in lateral movements of the globe, congenital disturbances of the sympathetic, defects of the ocular portion of the facial nerve, anomalies of the 5th nerve, congenital anomalies of lacrimal secretion, congenital retracting movements of the eyeball, enophthalmus and nystagmus, congenital word blindness.

In a most interesting chapter on the general etiology of malformations of the eye P. shows how our views have changed by the elimination of inflammation and its influences on the developing and growing eye, although the occurrence of fetal inflammations is admitted which in defective eyes may gain greater extension. Heredity plays the most important part, even if we are still far from satisfactory explanations, and its source must be sought in a faulty condition of the germ plasma.

In the next chapter on fetal inflammation we learn from a review of the separate parts of the eye how materially this factor has been reduced. Finally the injuries of the eye during birth are presented with special consideration of intraoular hemorrhages in their far-reaching results.

The literature is extensively utilized and a bibliography given at the end of each chapter. We highly recommend the very useful work which is very readable on account of its pleasant style and excellent paper and print.

C. Zimmermann.

**Encyclopedia of Ophthalmology ("Encyklopaedie der Augenheilkunde").**— Schwarz, O., Prof. Dr., Leipzig, with 154 collaborators. No. 16. Leipzig, F. C. W. Vogel. 1908. 2M. $0.50.

With regard to the general scope and merits of this useful work we beg to refer to our reviews of the preceding numbers of Ophthalmology, April, 1906, and October, 1907. The present number brings, in lexicographic form, subjects under the letters R and S. It commences with an article by A. Vossius on eye diseases caused by the hairs of caterpillars, ophthalmia nodosa, then on reflex streaks of the retinal vessels by A. Elschnig, refraction, its anomalies and objective and subjective determinations by Straub, Rocoss's discs, temporary resection of the orbit by Braunschweig ,the various forms of retinitis by Schwarz and Magnus, rachitis with reference to the article on malformations of the skull, rheumatism and cold by Schwarz, Roentgen rays by Schwarz, rotation of the eye by Ostwalt, diseases of the spinal cord by Schwartz, Bruns and Moebius, poisoning by santonin, scarification, formation and malformation of the skull, eye symptoms in injuries of the skull, scarlet fever, skiascopy, scissors, apparent size and movements, and very elaborate articles on squint and its treatment and operation by Kunn, Schwarz, Bielschowsky, Elschnig and Straub, theories of strabismus by Schwarz, snowblindness, school oculists, shotgun injuries, protective spectacles, pregnancy, intoxication by carbon disulfid.

We have mentioned only a few of the longer articles, there are many minor ones and others refrring to more exhaustive essays under related subjects. Like the foregoing the articles are concise but contain all that is essential to know for quick orientation, and impart to the book its eminently practical value. We anxiously hope that the work will soon be completed.

C. Zimmermann.

**Diseases of the Eyelids.**— Von Michel, J., Professor, Berlin. Graefe-Saemisch. "Handbuch der gesamten Augenheilkunde." Second, entirely new, edition. Nos. 148-159. 473 pp., with 74 figures in the text and 25 on six plates. Leipzig. 1908. 24M. $6.00.

The great difference between the 2nd edition of von Michel's elaborate book and the 1st, which appeared in 1876, is externally illustrated by its growth to more than 4 times the number of pages. This has been brought about by the addition of many new chapters on subjects of which our knowledge at that time was very limited or nil and a discussion of which became only possible by the great progress of ophthalmology and allied sciences and the creation of entirely new branches, e. g., bacteriology, by the extensive utiliation of which the author admirably succeeded in producing this excellent modern standard work. The subject is arranged according to the different anatomical constituents of the lids, viz., in diseases of the skin, tarsus, muscles and nerves, and anomalies of position, form and size of the eyelids and the palpebral fissure.

The first section considers the disturbances of circulation of the skin of the lids, exudative inflammations: infections and toxic hematogeneous dermatosis, local infection, neurotic and eczematous, and chronic inflammations, mycosis fungoides, lepra, tuberculosis, syphilis, etc., hyperkeratosis, hypertrophy, atrophy and degeneration, anomalies of pigmentation, tumors, dermatomycosis, protozoic diseases, affections of the glands and of the cilia the knowledge of which has recently been so materially advanced, especially by the careful investigations of Raehlmann, Herzog, Vogt and others.

The diseases of the tarsus are divided into diseases of the Meibomian and Krause's glands and the substance of the tarsus. The affections of the muscles and nerves are introduced by anatomo-physiological remarks and deal with the motor disturbances of the lid movements from diseases of the orbicularis, levator, and the smooth muscular fibres, followed by disorders of the lid reflexes. The numerous, partly colored illustrations splendidly demonstrate the clinical appearances and anatomical changes. Complete bibliographies are appended to each chapter. C. Zimmermann.

**Organology of the Eye.**—PUETTER, A., Dr., Goettingen. Graefe-Saemisch, "Handbuch der gesamten Augenheilkunde." Second, entirely new, edition. Nos. 162 to 166. 395 pages, with 212 figures in the text and 25 on 10 plates. Leipzig: Wilhelm Engelman. 1908. Subscription. 10M. $2.50.

The author defines organology as the doctrine of the eye as organ which is built from different elements, forms as a whole a functional unity and is embodied in an organism to which it subserves and with which it has many mutual correlations. According to the usual terminology it might be called partly comparative anatomy, partly comparative physiology, partly biology or etiology of the eye. These present, however, only one methodic point of view, while organology in the sense understood by the author comprises, for the solution of its problems, all methods available: anatomic, histologic, embryologic, as well as physiologic, chemical and etiological methods.

It is presented under a general part on light and effects of light, excitation by light and light sense, visual sense and optical sense of space, distribution and achievements of the organs of light sense.

In the special part of the nervous apparatuses of the organs of light sense are discussed: light sense cells, light sense epithelium and their central combinations, then the accessory apparatus of the light sense organs: refracting, for forming images, diaphrams, for contrast, accommodation, molding and supporting tissue, circulatory and protective apparatus. Under light sense organs as unities the physiological, systematic and morphological types of eyes are presented, under light sense organs in connection with the organism, the size of the eye, the eye in its relations to other organs, the optical space, the visual acuity and finally the conditions of the specific formation of the visual organs.

The author considered as his task: evolution of the problems, comprehension under general points of view, formulation of new questions and outlooks. From the immense material of organology distributed in innumerable single observations over an abundant literature he selected what appeared to him most important. Still there is an unusual wealth of knowledge embodied in the work, which does not allow of entering into detail. The reader will be extremely fascinated by the interesting book whichever chapter he may take up. The numerous black and colored illustrations are most artistically executed. P.'s work is an excellent addition to the great handbook. C. ZIMMERMANN.

**On the Functions of the Brain and Spinal Cord.**—"Ueber die Functionen von Hird & Rueckenmark. Gesamelte Mitteilungen, Neue Folge. MUNK, HERMANN, Professor at the University and Member of the Academy of Sciences, Berlin . 371 pp., with 4 figures in the text. Berlin. 1909. August Hirschwald. 6M. $1.50.

This valuable book will be heartily welcomed, as it contains the epochmaking researches of the celebrated author from 1891 to 1908, originally published in the transactions of the Berlin Academy of Sciences. The titles of the separate essays are: visual sphere and perceptions of space, the tactile spheres of the brain, contractures after diseases of the brain, the extension of the sensory spheres of the cerebral cortex, the consequences of loss of sensibility of a limb for its motility, the functions of the cerebellum.

In 2 critical articles, one "on the dog without brain," M. refutes with facts based on very exact observations the fallacy of Goltz's arguments against cerebral localization, and in "the physiology of the cerebral cortex" the attacks of Hitzig, who did not recognize the existence of tactile, visual, acoustic or similar spheres but simply spheres of perception and consciousness, are defeated in a very objective manner.

Most interesting are the elaborate chapters on the functions of the cerebellum in which the discrepant views of Luciani and Lewandowsky are scrutinized and the observations of M. on his numerous methodical and ingenious experiments after unilateral and total extirpations of the cerebellum of monkeys and dogs are presented with admirable argumentation and the following conclusions: The cerebellum is the organ in which spinal and muscular centers of the vertebral column and the limbs are in such connection that by its activity involuntary and unconscious appropriate (coordinate) common motions of the vertebral column and limbs are produced, especially the preservation of equilibrium in the ordinary positions and movements of the animals in lying, sitting, standing, walking, climbing, swimming, etc., or briefly: The cerebellum is the central organ for unconscious coordinated common motions of the vertebral column and limbs in general and for the finer preservation of equilibrium of the animal in particular. The finer preservation of equilibrium is especially emphasized as the main and, for the existence of the animal, most important achievement of the cerebellum, and therefore after removal of the cerebellum, it is functionally replaced as soon and as good as possible. As little as the cerebellum is the organ of equilibrium, is it an organ of coordination beyond the limits of its specific tasks? The coordinated movements of locomotion have nothing to do with the cerebellum but are affected by principal centers, most likely in the pons, and only the 2nd requirement, the finer preservation of equilibrium is achieved by the cerebellum by coordinated movements of the vertebral column and limbs. Through the closer nervous connections between pons and cerebellum their right cooperation is secured. For its specific functions the cerebellum has special connections with the spinal and muscular centers of the vertebral column and limbs in the nerve fibres which, after extirpation of the cerebellum, are found degenerated in the marginal portions of the anterior and antero-lateral fascicles of the spinal cord. M.'s elaborate work, which is written in a most attractive, clear style, will fascinate the reader intensely and will give him a splendid exposé of the achievements of the physiology of the central nervous system based on a technic according to modern surgical principles, and methodic and careful clinical observation. C. Zimmermann.

**The Visual Disturbances in Gun Shot Injuries of the Cortical Visual Sphere.— From Observations on the Wounded of the Last Japanese Wars. Inouye, Tatsuji, Tokyo, "Die Sehstoerungen be Schussverletzungen der corticalen Sehsphaere. Nach Beobachtungen an Verwundeten der letzen Japanischen Kriege." With 30 figures in the text and 2 plates. Leipzig: Wilhelm Engelmann. 1909. 6M. $1.50.**

In the introduction I. describes his method of exact localization of the single parts in the head in the coordinate system whose O point is placed in the protuberantia occipitalis externa. From the average figures obtained by measurements of numerous Japanese heads I. constructed a model of the head with the craniocoordinometer which he devised for that purpose. The place of the wound is exactly reproduced on this head model and by the brain model, on which the position of the fissura calcarina, fissura parieto-occipitalis and visual radiation is projected as accurately as possible, one studies how one or 2 injuries (entrance and exit of the bullet) on the head model may damage the brain model.

Then the way and manner of injuries by modern projectiles are discussed. From his observations I. found that the small bullets generally penetrate the brain in a straight line. By the location of the bone wound the localization of the injury of the brain is usually given. I. shows how by geometrical construction the course of the canal taken by the bullet can be exactly pursued.

Now follow the detailed reports on 28 cases of penetrating injuries of the head with visual disturbances, selected from about 80,000 wounded, viz., 4 pure and 2 impure right or left hemianopsia, 4 pure and 1 impure inferior hemianopsia, 3 pure and 1 impure inferior hemianopsia quadrata, 1 pure and 1 impure superior hemianopsia quadrata, 1 pure small and 2 probable pericentral scotoms, 1 large inferior pericentral, and 1 paracentral scotoma, 2 cases with no homonymous defect and marked atrophy of the optic nerve, 2 large and 3 medium sized pure concentric contractions of the visual field and a case of multiple annular scotama. In the 4 cases of inferior hemianopsia both visual spheres were injured from behind and above and thus probably both visual spheres above the fissura calcarina. In one case of pure inferior hemianopsia the visual radiation most likely was injured from above, and in the 4 cases of inferior hemianopsia quadrata the mathematical calculation suggested an injury of the corresponding visual sphere or visual radiation of one side from above ,and in a case of superior hemianopsia quadrata the foremost portion of the visual graduation from below.

The last chapters are devoted to the graphic demonstration of the visual field and the true surface of the visual sphere. I. assumes 2 functional parts of the whole visual sphere, viz., a main and a supplementary visual sphere. The main part corresponds to the visual sphere proper with a sharp projection of the retina on the cortex, the supplementary part comprises the remaining visual sphere with a projection of the retina, but not a distinct one. The function remaining in bilateral hemianopsia, and limited to the point of fixation, is, according to I. the function of the supplementary visual sphere, which but by the severe functional disturbance of the main visual sphere, has become objectively noticeable.

I.'s well gotten up monograph is by the great variety of clinical material and the practical original devices for exact localization, a very valuable contribution to the affections of the visual spheres, and is warmly recommended for a closer study.

C. Zimmermann.

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## ERRATUM.

In Dr. Gifford's article, page 229, Vol. V., No. 8, Jan., 1909, Two Cases of Vossius' Ring-shaped Apacity of the Lens," there is a misprint. In the description of the second case instead of. a ring in the lens "showing sharply 1-32 of an inch in diameter with transmitted light. and not at all with reflected light" the measurement should have read "3-32 of an inch in diameter."

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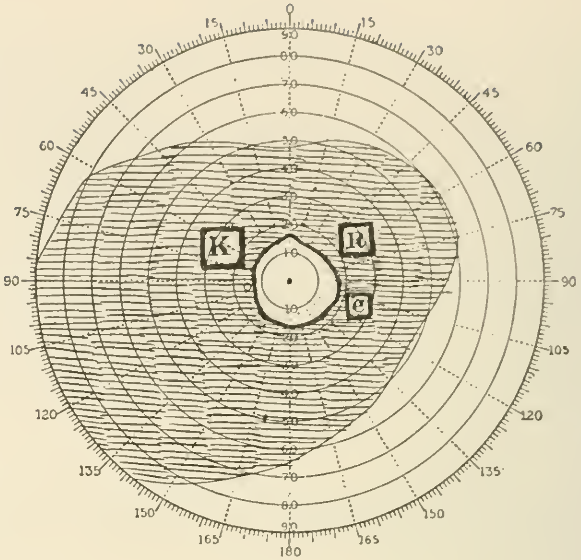

FIG. 1.

Visual Field for 5 mm. K, 3 mm. R and 2 mm. c. All three are recognized as **marks** at the same distance from the center, but only the letter K is recognized correctly; the other two, even when in center being mistaken, the R being called "eleven" and the e as "six."
R. E., M. as V. gl=5/vi.
L. E., T. as V=5/xxiv. gl.=5/xviii.

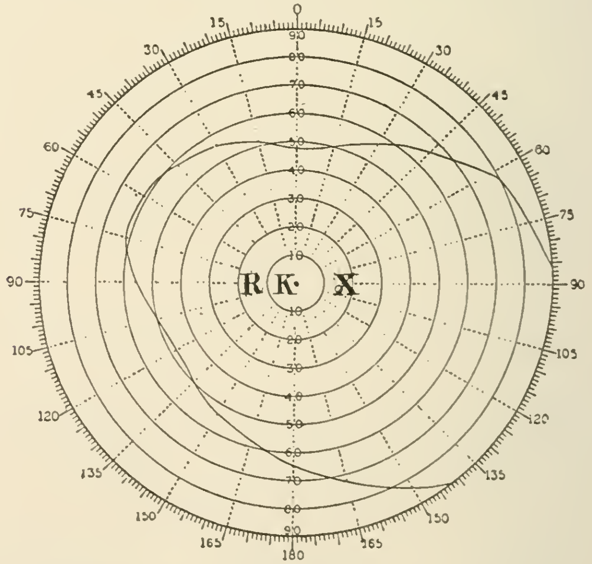

FIG. 2.

Partially amblyopic eye from old optic neuritis.

V=5/xxxvi. not improved by glasses. Can only fuse pictures in the amblyoscope when the light over the other eye is greatly reduced. Yet, a 10 mm. R and a 2½ mm. K are perceived as marks (X) at exactly the same spot but as letters with the smaller nearer the center, hence, pointing to the probability of an anatomical lesion as the cause.

(See page 573.)

# OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS.

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## *Original Articles*

### AMBLYOPIA EX ANOPSIA—ITS NATURE AND TREATMENT

A. Alison Bradburne, F. R. C. S. (Ed.), Southport, England.

The expression amblyopia is applied to those cases in which disturbance of vision exists without apparent lesion, and when it follows non-use of the eyes the condition is termed amblyopia ex anopsia.

Any cause which prevents the formation of a sharply defined image on the retina can bring about the condition, hence diseases of the cornea, lens, etc., especially when associated with opacities, are particularly liable to lead to it. Malformations of the refracting structures of the eye, however, are the commonest cause, and produce a condition of amblyopia which forms a class by itself. It is obvious that high degrees of long or short sight or of astigmatism, especially if occurring only in one eye, are bound to lead to non-use of the eye owing to the impossibility of obtaining accurately formed images on the retina.

It is of this class, viz., amblyopia from non-use as the result of high refractive error, that I wish more particularly to speak of here.

The defect in the vision consists in an inability to recognize words, letters or figures below a certain size, even after any error in refraction has been perfectly corrected. The degree of the defect varies not only with the amount of refractive error but with the period of duration and to a certain extent with the individual intelligence. In the great majority of cases the defective eye is of no practical use for such purposes as reading and writing or for the carrying out of the finer functions necessitated by modern day requirements.

As the condition is extremely common, far commoner than is generally realized, and as its presence is a serious handicap and its recovery problematical, except when recognized and combatted in very early life, the importance of the subject is self-evident. The condition is frequently mistaken for congenital amblyopia, in fact, both terms are often used to express a condition of which we are in total ignorance, or one which our knowledge or means of investigation are powerless to diagnose correctly. The essential difference between the two conditions seems to be that in the exanopsic form the full visual faculty would have developed normally, had there been no impediment to the rays of the light focussing accurately on the retina, whereas in the congenital form, in addition to the optical obstacles, a further factor is present which of itself is sufficient to prevent normal vision being obtainable, the cause in all probability being an anatomical one of the retina, optic nerve fibres or cerebral cells. To distinguish between the two is often impossible, but, according to several authorities, a central scotoma is present in 60-90 per cent. of the cases of the congenital form. Now in the amblyopia from non-use, the absence of demonstrable anatomical causes—except, of course, those which bring about the condition—shows that the defect is a purely functional one.

The function which is at fault is that associated with the recognition of letters, words and figures, and as this is the function of either the cones of the retina or the visual perceptive centres in the brain, the defect must be situated in one or other of these situations.

In the majority of text books it is held that the cones are at fault in this condition, and though this may be true, I am of opinion that the primary lesion is a cerebral one, the cones, if at fault, being but secondarily affected.

As the affection is a purely functional one, the arguments in support of one's theory can only be deductive and based upon experiments in which the personal factor has to be taken into consideration, and hence may be misleading; moreover, our limited methods of experimentally testing any function do not tend to make investigation easy or absolutely accurate.

We have seen then that the defect is a purely functional one and that it consists in an inability to recognize certain sized markings *as letters or figures.* This amounts simply to letter blindness, a condition closely akin to word blindness, which we all know is a brain defect. This of itself seems strong argument in favor of a cerebral lesion as against a retinal one.

When pathological changes the result of disease affect the macula portion of the retina—where the cones are situated—we determine such by means of a perimeter. This instrument carries certain test objects from the periphery to the centre of the visual field, hence when the cones are diseased the test object becomes blurred or completely lost to sight when brought into the centre over the situation of the macula.

Now in testing cases of amblyopia ex anopsia with this instrument, not only is no central blind spot found, but the smallest of letters is seen over exactly the same area as the largest. The only difference which exists is the fact that the larger markings are correctly recognized and named, whilst the smaller are but seen as marks. That is to say, the smaller have no intelligible meaning whatever, though they have a visual affect. It seems logical to assume that if the defect were due to the defective functioning of the cones, the smaller letters would not be seen even as diagrams, and further, would require to be brought nearer the centre, where the cones become finer and more numerous (Coats) than the larger letters before being recognized even as marks.

Tests with the perimeter, with letters 10 m. m. and 3 m. m. in size show exactly the same size visual field, and further there is very little difference in the visual area between a normal eye and an amblyopic one. If the cones were at fault, one would expect to find not only a proportionately much smaller visual field than in a normal eye, but a difference dependent on the size of the letter used as a test object.

Again, if the individual under examination be asked to name the letter used in the test, it is found that a ready but mistaken answer is given, no matter how small the test letter, and this phenomenon has its exact counterpart in what is met with during the process of teaching children their letters, and in them we do not attribute their ignorance of the letter to a *retinal* lesion.

These arguments seem to show then, that as the smaller letters are *seen* but are not *recognized*, there must be two visual centres—one associated with the purely visual act of perception and another having to do with higher functions associated with vision. According to Henschen's theory this is so, and if his theory be correct then it seems that amblyopia ex anopsia is due to a lesion of the higher visual centre. Henschen's theory assumes the existence of two visual centres, one in the angular or angulo-occipital region, subserving the function connected with the recognition of words, letters or numbers, which he calls the higher visual centre, and another also connected with the macula vision, situated in and around the anterior extremity of the calcarine fissure, this cortical centre subserving vision in its most primitive sense, that is for luminosity, it forming, however, a purely perceptive part of the visuo-sensory area. Natural objects, faces, persons, designs or even letters, words or numbers, are perceived through the function of this lower macular cortical area, *but without any recognition of their significance.* Perception by this lower macular centre does not evoke concrete ideas, the result of visual memories, such visual ideas being the outcome of the higher visual centre. Actual experiments of extirpation of these areas in monkeys, as have been carried out by Ferrier and Yeo, show by the absence of any appreciable impairment of vision the great probability of the soundness of Henschen's theory.

The function which is defective in this type of amblyopia is a complex one, necessitating the co-operation of the visual memory centres, and it seems illogical to assume that this centre could have any physiological association, except with another cerebral centre.

During the process of training these cases we note that a certain interval of time, especially in the early stages, elapses before correct recognition of a letter takes place. That the image of the letter is not delayed after its impact on the cones can be proved by the readiness with which the letter is seen as a mark, but its intelligent response depends upon the working of sluggish cerebral centres—probably several—hence explaining the very evident delay; this again supports the theory of the defect being cerebral and not retinal. Another confirmative result is that evidenced by the manner in which the field for letters improves, where it is a purely macula improvement the visual field for recognition of letters would be circular, that is, equal in all directions around the centre. In actual practice it is shown, that the letters extending to right and left are earlier comprehended correctly than those immediately above or below the centre, even though the latter be not as far removed from the centre as are the lateral ones.

This phenomenon supports the theory which holds, that a special centre exists which subserves a horizontally oval section of the centre of the visual field. Another argument which seems to tell against the theory of the retinal cones being the cause is, that were such true, an almost complete recovery would ensue from the constant wearing of correct glasses *alone,* which is not the case. Recovery of even a moderate amount of vision does not occur unless special efforts are made by the patient to train his defective visual powers. As the glasses do all that is required to enable the cones to functionate correctly, it is obvious that there must be something further at fault if recovery fails to follow, and the very fact that mental effort is necessary confirms the theory of a lesion of a cerebral nature.

It seems to me a fortunate circumstance that we can attribute the cause to a cerebral defect, as it holds out brighter prospects as regards prognosis, for a retinal lesion would be naturally far less amenable to treatment, as except by the employment of glasses we possess so little means of improving retinal defects, and further it is due to such erroneous views having been held that so little has in the past been done for the affection.

Treatment then based upon the theory that the defect is due to a failure on the part of the higher centres to fully functionate, must be obviously associated with the adoption of methods which are educative. We must educate the visual centre from intelligent appreciation of light to objects of large calibre demanding exercise of mental efforts for their appreciation, from such we pass on to smaller objects such as details in pictures, and from pictures to letters and figures, and lastly to words composed of small letters.

In the process of training it is essential to remove from activity the visual centre which the patient employs and which has carried out all the necessary functions up to the time of his coming under treatment, for as long as the brain possesses one fully developed visual centre, the need for exercising the other defective one is not present. That this is so, is proved not only in cases of hysterical amblyopia, but also in those cases of amblyopia from non-use which begin to improve of their own accord when as, for instance, during the incipient stages of cataract, the sight of the good eye gradually fails.

Complete occlusion then of the fellow eye is nearly always essential at first, and also extra stimulation as can be carried out by illuminating transparent pictures in the amblyscope are the means to be employed to rouse the dormant faculty in the visual centre. When once aroused the improvement is fairly rapid and the next difficulty is to overcome the tendency which is present for the good eye to take up the function of seeing on behalf of the other as soon as the eyes are employed together. For this purpose it is necessary to obtain diplopia which is best done by means of prisms, the separation of the images preventing the tendency to fusion and aiding development of each centre separately. When the defective visual centre has reached the stage of seeing under equal illumination to that of the normal eye, letters, pictures, etc., can be used from reflecting surfaces in place of through transparent cards. To assist the development I have had made for me an instrument by Messrs. Armstrong, of Manchester and Liverpool. It consists of a series of cards and a holder, and is intended to be used at home by the patient. On each card are printed letters in two sizes, so arranged that a small and large letter alternate. Each card has progressively a small size of type, the smallest being composed of the 5-point type. When the instrument is held at the far end of the instrument. Thus, in normal eyes held by the handle in front of the face, the two prisms opposite the eyes produce a vertical separation of the image of the card an image of the card is presented to each eye. In the case of a patient who has by non-use forgotten how to use one eye the card belonging to the amblyopic eye will only show the large letters; the intervening smaller letter will be unrecognized. To elucidate this feature, the normal eye must be covered and the patient asked to read the letters he sees. When the correct card is in position the patient will "stutter" over the smaller type. Under such circumstances the other should be momentarily uncovered, by which means he will recognize the letter correctly. Then on re-covering this eye the patient should endeavor to see the letter by his amblyopic eye. Such recognition will not be instantaneous nor for some time permanent. The patient has to teach his receptive perception centre to remember the letter just as he teaches and cultivates his "memory" for pictures, poetry, prose, history, dates, etc. As soon as one card is mastered the next smaller is similarly dealt with until they all are mastered. When one endeavors to train an amblyopic eye by means of a single picture of letters any mistakes in naming of letters has to be corrected by word of mouth, that is, the patient learns the nature of the image presented to his brain by means of the auditory channels. With my instrument he learns by means of the optic nerves and visual centres, which seems a sounder and more rational method. The use of this instrument, in addition to enabling the patient to practice at home, enables the trainer when the patient comes for the other lessons to examine by means of the card for evidence of progress and for proofs of attendance to one's injunctions regarding the carrying out of the exercises at home.

Great patience, perseverance and the ability to adapt and devise methods suitable to each case are important adjuncts in the treatment of these cases if we wish to obtain success, and it is important to impress upon the patient or his friends that success means time and strict attention to the minutest details.

Electrical treatment in the form of the sinusoidal currents, vacuum electrode or galvanism has in some hands been reported as beneficial. Webster Fox, in the Journal of Advanced Therapeutics for April, 1907, says that "we have in electricity a curative measure much more simple and radical than the fusion method with the amblyoscope, for it develops the fusion power while electricity may increase the vision." He quotes the case of a patient aged fifty-two with vision of 3-cc. improved to 6-l. after thirty applications with the vacuum electrode used for three to fifteen minutes, and Dr. Casey Wood, in his system of Ophthalmic Therapeutics, a patient who could only see the finger tips at six inches and after six months' treatment with the sinusoidal current was able to distinguish fingers at two feet. Improvement in ten other cases is also reported by the same authority, but it is doubtful if they were all cases of simple cerebral amblyopia from non-use, the result of high refractive error. For all that, there seems no reason to doubt the efficacy of electrical treatment, in that it may possibly stimulate the retinal elements and optic nerve fibres in just such a way as the extra light stimulation does with the amblyoscope and in stubborn cases would certainly be worthy of trial.

One of my early cases was that of a boy aged eleven years who had squinted with the right eye since two years of age and the vision when he came to me was only 5/lx. Tested with the amblyoscope showed also deficient perception for pictures but under increased illumination this was early overcome. Then in place of the pictures a set of letters, arranged on the same plan as in my home trainer, but printed on transparent sheets of celluloid were used in the amblyoscope, and it was not long before he was able to recognize the small letters. Total exclusion of the left eye, and home lessons were instituted and later double vision training with prisms produced vision of 6/vi. and J. 1 in the right eye, a result gratifying and pleasing to the parents and myself, but which is possible, I believe, in nearly every true case of amblyopia ex anopsia ensuing from high refractive error.

# THE RESTORATION OF VISION IN STRABISMUS.

By A. Alison Bradburne, F. R. C. S. (Ed.)
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During the past ten years the treatment of squint has made great strides. Formerly glasses alone were prescribed; then supervened the period of promiscuous tenotomies which by their untoward results produced the natural effect of setting back the operative clock until the period for obtaining the best results was passed.

Thanks to the able and painstaking researches of Worth, a scientific line of treatment has been evolved out of the chaotic condition into which matters had drifted. He showed that a defective cerebral function, named by him the "Fusion Faculty," had a great deal to do with the development of squint and to cure this the fusion faculty required cultivation. Thus, it has come to be generally recognized that the presence of a squint is but one sign of other defects and that the restoration of the normal alignment of the eyes is but a portion of the treatment which squint requires.

The presence of a squint, in addition to its outward manifestations nearly always indicates, (1) Some error of refraction, (2) A defect in the fusion sense, (3) A defect in the vision of the squinting eye which varies with the age or onset and duration. Therefore the scientific rectification of strabismus must include measures to correct each of the above. Glasses correct the refractive error, or the optic exercises or operation remedy the faulty position, training with the amblyoscope overcomes the cerebral defect, and in certain cases before the visual defect has been left uncorrected too long these measures will tend to restore it. The limit of age at which such restoration can be accomplished is held to be six years ,and unless steps are taken quite early in life to remedy this before the habit of using the straight eye entirely to the exclusion of the deviating eye, the condition known as amblyopia ex anopsia is bound to ensue. That the age limit is six years is unfortunately in the majority of cases true, yet that there are exceptions and that such exceptions may some day prove to be commoner than is at present thought to be the case, I think the result of the case I have to report will prove. Excepting cases of congenital blindness in one eye, what right have we to assume that restoration of useful vision cannot be obtained in an organ which as far as we know once performed its full share of duties? If we fail to obtain its restoration of function surely it is more logical to attribute the non-success to the methods adopted than to the materials on which we have to work. Holding such views I have for a long time been seeking a method for obtaining what up to the present has been considered impossible of attainment and though one cannot as yet produce any very great results what one has obtained more than justify one in persevering along the same lines.

Worth's amblyoscope was invented by him to overcome the defective fusion faculty by training the brain to recognize the presence of the two pictures which the possession of two eyes affords. Briefly, the method consists in putting before the eyes two pictures and by increasing the illumination in front of the eye with the defective vision and decreasing that before the better (or more used) eye, a simultaneous recognition of both is obtained on the brain; eventually both pictures are recognized under equal illumination; then by mechanical means they are superimposed until by degrees they are blended in the brain into one true picture, appreciative of depth and perspective. This training amounts to the restoration of what for want of a better term I call "Landscape vision" and can be accomplished in a fair number of cases in which amblyopia has supervened in one eye.

The restoration of "Landscape vision" in the originally squinting eye is of no practical use in regard to the employment of the eye for reading or writing and injury, disease or operation in the "straight" would be a serious handicap to such individuals. Hence it is obvious that no case of squint can be considered as *cured* in the fullest meaning of the word unless we can convert this "Landscape vision" into the ability to recognize *letters and figures.* Up to six years of age the method so ably laid down by Worth accomplishes both but after this we must seek other means. How far this restoration can be accomplished and in what proportion of cases it is impossible just at present to say, but there is little doubt that there are a large number of patients in whom the amblyopia is only latent and in whom the full, or a very great part of, useful vision can be obtained. It has always been clearly proved that to leave a squint to be grown out of or until the child is old enough to be operated on is unjust and unscientific, that the proper course is to adopt amblyoscopic and training exercises as promptly as possible. So now it is just as unscientific to put on one side all attempts to teach the eye to read, simply because up to the present no success has attended the efforts made to restore vision in the amblyopic eye. There will be found cases which do not turn out successful and others which will yield most gratifying results and it is impossible, without careful investigation and in many cases practical trial, to distinguish one from the other.

The investigation of any case of squint should always include an examination as to the presence of the fusion faculty, and in those cases in which it cannot be developed we should not conclude that the monocular visual perceptive centre is incapable of being awakened. If we cannot obtain a blending of the two images, we ought to endeavor to obtain recognition of either picture and then proceed to smaller and smaller objects until printed type can be recognized; in fact it is not necessary in every case to obtain fusion, it frequently being advisable to use a prism base up before one eye so as to obtain diplopia and by this means cultivate each visual centre in the brain. With the prisms we can also cultivate those inert portions of the retina in cases where a false macula has developed, the indications for such develop as the case proceeds.

The following case is one corroborating the above:

A youth aged 11 years was brought to me in November, 1907, his right eye turned in 8 degrees and central fixation was possible but only slowly accomplished; the left eye was used in both near and far vision. The squint was first noticed when patient was 2 years of age and had been attributed to teething. There was no history of any relative having a squint. He was seen by an ophthalmic surgeon when 4 years of age who had prescribed glasses and apparently made no attempt to test for the presence of the fusion sense. He had been seen from time to time and when he came to me was wearing

R+.05 R
L+.05 D. cyl. ax. 180 degrees

in the right eye and in the left a + 1.00 sph. With these glasses he had 5/v vision in the left but only 5/lx with the right eye and glasses made no difference to the vision of this eye. Tested with the amblyoscope showed there was deficient perception to pictures in the squinting (the right) eye; but after half an hour's graduation of the illumination recognition of both pictures was obtained and this was quickly followed by blending. He was instructed in certain home exercises and when seen again on December 11th the vision in the right eye was now two letters of 5|xxiv. and with the amblyoscope true vision was soon obtained. In place of the amblyoscopic pictures a set of type printed letters on transparent sheets of celluloid were inserted; these sheets of printed letters contained two sizes of type, the larger being equal to letters readable at 9 feet, and the smaller equal to Jaeger No. IV.; these sizes alternated with each other. It was found he could slowly read out the larger letters, but skipped the intervening ones. His parents, who most ably co-operated in my endeavors, at my suggestion bought him an alphabet set of letters on pieces of cards, with which he built up words with his left eye and then endeavored to decipher these with the right.

December 19th, Fusion exercises with both pictures and type were carried out, it was noted that as the tube in front of the right eye was moved in the direction which brought the letters over the outer portion of the retina they became suppressed; by therefore adjusting the tube this portion of the retina was exercised.

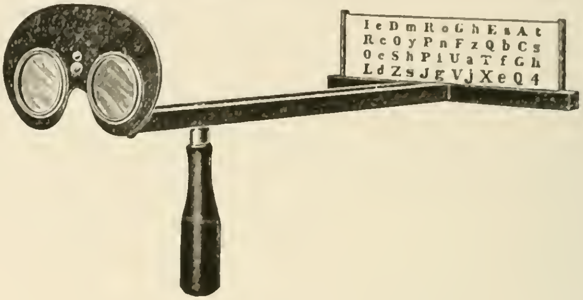
December 24th, on this date the vision in the right eye had improved to 5|xviii and the ability to take up and maintain fixation was greatly improved. He was seen once a week and at each visit exercises were carried out with the pictures and two letters of 5|xxiv and with the amblyoscope true vision was letters, and by degrees the ability to maintain fusion was fully cultivated and he could read type in the amblyoscope equal to J. 8 and J. 4. For nearly two months very little progress beyond this stage was made, for a time atropine was used in the fixing eye, the left, and this was supplemented by a total exclusion pad so that whilst at school he did all his work with the right eye.

By March 20th the vision in the right was equal to 5|xxiv without glasses and 5|xviii partly with glasses, but the 2nd of April he could read four letters of 5|ix. During this period of six weeks additional exercises with a 6° prism base down has been instituted and after painstaking efforts we obtained double vision, this being aided by dark glasses in front of the left eye. Early in May the vision in the right eye had risen to four letters of 5|vi and the shade was removed from the left eye. The removal of the shade, it was feared, would cause the left eye to take up the work of seeing again, to the detriment of the other eye, but instead the vision in the right eye continued to improve and by the end of June he could read without his glasses 5/vi and Jaeger 1. This satisfactory condition was unchanged when he was seen again in September and an operation was performed which satisfactorily removed the unsightly consequence. The patient now has dispensed with his glasses, has no squint, has fully cultivated fusion faculty with its accompaniments of true perspective, and last but not least has had restored a normal ability to read and write; in fact a complete cure has been accomplished.

This patient, in that he was exceptionally bright mentally, in that there was not much refractive error or any great difference in the refraction of the two eyes, was a particularly favorable subject and justified one in expressing the opinion at the commencement of the treatment that the lost vision could be restored, a fact which subsequent events amply proved. But judging by others, far less favorable cases, which have proved, as far as they have gone, capable of great improvement, there seems good reason for believing that after all we may be able to remove the last stumbling block which remains in the treatment of squint. During the course of exercises with the printed type in the amblyoscope a very interesting feature showed itself. By some authorities it is held that a certain portion of the brain controls a horizontal section of the center of the visual field. Now, as this case progressed, it was noted that the lines of letters running across the center of the visual field were the earliest to become recognized, the lines in the upper and lower parts of the field developing later. In the stages of development it was noted that the intermediate letters were not seen, every alternate letter, no matter its size, being recognized, as improvement followed this skipping of letters became less and less in the horizontal line in the center of the visual field, whilst it still remained in the upper and lower portions. This interesting feature, I think confirms the theory of the function of the cerebral visual center and comprises the view that there is a special centre for the horizontal centre of the visual field and tends to show that these cases of acquired amblyopia are due to a cerebral and only partly a retinal defect.

The accompanying illustration is that of an instrument which

Messrs. Armstrong of Deansgate, Manchester and Bold Street, Liverpool, have brought out for me. It consists of a series of cards and a holder; on each card are printed letters in two sizes,


I e D m R o G h E s A t
R c O y P n F z Q b C s
O c S h P i U a T f G h
L d Z s J g V j X e Q 4

Author's Stereoscope for Squint.

so arranged that a small and large letter alternate. Each card has progressively a smaller size of type. The smallest being made up of 5 point type. When the instrument is held by the handle in front of the face, the two prisms in the apertures of the face piece produce a vertical separation of the image of the card held at the far end of the instrument. Thus in normal eyes a complete set of letters is separately seen by each eye but when one eye is amblyopic the card as seen by this eye will only show the larger letters, the intervening smaller sized type being unrecognizable. To elucidate this, the normal eye must be covered by the readily removable screen and the patient asked to read out loud the letters he sees. When a suitable card is in position the patient will "stutter" over the smaller type. Under such circumstances the other eye should be momentarily uncovered and thus the letter named correctly. Then the eye should be recovered and the patient endeavor to make the amblyopic eye see the letter for itself. Such recognition will not be instantaneous nor for some time permanent, for the patient has to teach his receptive perception centre, to remember the letter just as he teaches and cultivates his "memory" for pictures, poetry, prose, history, dates, etc. As soon as one card is mastered the next smaller in size is to be similarly mastered until all the letters on the smaller card are fluently read. When one endeavors to train an amblyopic eye by means of a single picture of letters any mistakes in naming the letters has to be corrected by word of mouth, that is, the patient learns the nature of the image presented to the brain by his auditory channels. With my instrument he learns by means of the optic nerves and visual centres, which seems a sounder and more rational method. This instrument is intended to be used at home by the patient, who must, of course, be wearing his correction glasses, and by its use the surgeon can obtain evidence of progress and proof of attendance to one's instructions, regarding the daily home life use of the amblyopic eye which forms no small part in the management of such cases.

Now that examination of the eyesight is becoming more general in the very young, when from errors of refraction amblyopia exanopsia develops without leading to stabismus, it will be found that this instrument will form a valuable aid in cultivation of the eyesight and its restoration when from disuse.

# METASTATIC CARCINOMA OF THE CHORIOID—A CRITICAL STUDY WITH CASE REPORT.*

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CHICAGO.

Metastatic carcinoma of the chorioid is of such clinical rarity as to warrant the citation of any additional authentic cases. In order not to depreciate the value of statistical reports on this subject, but rather to enhance their value, we have taken as a basis for the study the statistics compiled by Marshall, Parsons and Oatman; and we have added to these lists all the authentic cases since reported in literature and, in addition, those which were overlooked by these three writers, as well as adding one from our own service.

Marshall carefully reported all cases up to 1897, being 24 in number. Parsons takes up the search from that date up to 1903, adding 9 additional cases, including his own. Oatman's article which appeared in March, 1903, added 4 new cases (one of these being his own) to Parson's list. In our careful research we have succeeded in finding 27 additional cases including our own. The majority of these cases have been reported since 1903; however, some few had been overlooked by both Parsons and Oatman. Of these 27 cases, 7 were reported prior to and 20 since Oatman's and Parson's articles appeared in 1903. There is no doubt but that these three articles stimulated the reporting of subsequent cases, for a total of 20 cases have been reported since 1903, while only 24 cases were recorded between 1872 (first case) and 1897, when Marshall's last case was published. It seems reasonable to suppose that there are quite a few more cases unrecorded, particularly when we consider a remark of Dr. Alt's: "I have examined several cases of metastatic chorioidal carcinoma, but they were not my cases" (personal communication, July, 1908).

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*Read at the Cleveland meeting of the American Academy of Ophthalmology and Otosanpyology, Aug. 27, 28 and 29, 1908.

C. D. MARSHALL'S LIST OF CASES OF METASTATIC CARCINOMA OF THE CHORIOID.
Royal London Ophthalmic Hospital Reports, Dec., 1897, vol. xiv., p. 415, 24 cases.

| No. of Case. | Author. | Where Published | Sex. | Age. | R.—L. Eye. | Tension of Globe. | Pathological Examination of Eyeball. | Seat of Primary Growth. | Secondary Deposits Other Than Eye. | Duration of Life After First Eye Symptoms. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Perls, M........ | Virchow's Archiv, 1872, Bd. 46 S. 437. | M. | 13 | R. and L. | ......... | Nodular flat tumor in both chorioids, R. ret. detached. | Right lung, 3 months. | Liver, brain, etc. | 1 month. |
| 2 | Hirschberg, J... | Centralbl. f. prak. Augenheilkunde, 1882, S. 376. | F. | 52 | R. and L. | Tn.......<br>Tn....... | Clinical only .................. | Right breast, 9 years. | Supraclavicular glands enlarged. | 7 mos. |
| 3 | Schoeler and Uhthoff (1)... | Centralbl. f. prak. Augenheilkunde, 1883, S. 236. | F. | 33 | R. and L. | R. T. + 1<br>L. Tn.... | R. swollen papilla, detached retina, invasion optic nerve and sclera. L. about disc and macula. | Left breast, 6 years. | Both ovaries, brain, dura and pleura. | 13 mos. |
| 4 | Hirschberg and Birnbacher .. | Graefe's Archiv f. Ophth., 1884, Bd. 30, Ab. 4, S. 113. | F. | 28 | L........ | T. — 1... | Detached and invaded retina. Flat tumor of chorioid. | Right breast, 6 years. | Lungs, bronchial glands, liver and kidneys. | 2 mos. |
| 5 | Manz, W....... | Graefe's Archiv f. Ophth., 1885, Bd. 31, Ab. 4, S. 101. | F. | 50 | R. and L. | R. Tn....<br>L. T. — 1 | Detached retina. Clinical only. | Right breast, 3 months. | Abdominal organs. | 2½ mos. |
| 6 | Schapringer, A. | Am. J. Ophth., 1888, vol. v. p. 285. | F. | 51 | L........ | Tn....... | Edema papilla, flat tumor in macular area. | Right breast, 2 years. | Lungs, liver and r. temporal bone. | 4 mos. |
| 7 | Mitvalsky, J., 1st | Archiv f. Augenhk., 1889, Bd. xxi, S. 431. | F. | 16 | L........ | T. + 2... | Flat cystic tumor. From optic disc to the ciliary body. Glaucoma. | Left breast, 2 years. | Brain and lungs | 3½ mos. |
| 8 | Mitvalsky, J., 2d | Ibidem .................. | M. | 35 | L........ | Tn....... | Flat tumor in macular area. Clinical only. | Left breast, 1 year. | Brain ......... | 2 mos. |
| 9 | Gayet ......... | Archiv d'Oph., 1889, p. 205 ...................... | M. | 30 | R........ | T. + 3... | Detached retina. Glaucoma. Discoid adenocarcinoma of chorioid. | Stomach.... | Brain, lungs and liver. | "Very short time." |
| 10 | Kamocki, V.... | Archiv. f. Augenhk., 1893, Bd. 27, S. 46. | M. | 37 | R........ | T. + .... | Detached retina. Glaucoma. Flat nodular adenocarcinoma chorioid. Optic nerve invaded. | Stomach.... | Brain ......... | 12 mos. |
| 11 | Schultze, S., 1st | Archiv f. Augenhk., 1890, Bd. 21, S. 319. | F. | 31 | L........ | Tn....... | Detached retina; 2 flat tumors in chorioid. Also epibulbar deposit. | Right breast, 1 year. .. | Medulla oblongata. | 4 mos. |
| 12 | Ewing, A. E.... | Graefe's Archiv f. Ophth., 1890, Bd. 36, Ab. 1, S. 120. | F. | 22 | R. and L. | R. T. + 1<br>L. T. + 1 | R. Tumor about O. N. forward into ciliary body and iris. Detached retina. | Left breast.. | Abdominal organs. | 12 mos. |
| 13 | Geunde C...... | Recueil d'Oph., 1890, S. 325. | F. | 51 | R........ | T. — .... | Cyclitis. Flat gray tumor chorioid. Clinical only. | Right breast, 9 years. | Skull, sternum, ribs, fingers, liver, lungs, heart. | Observed 3 mos. "Died later." |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 14 | Elschnig, A.... | Archiv f. Augenhk., 1890, Bd. 22, S. 149. | F. | 57 | L........ | T. + .... | Detached retina. Glaucoma. Flat tumor about optic disc. | Left breast, 1 year. | Brain, lungs and liver. | 4 mos. |
| 15 | Wadsworth, O. F. .......... | Trs. Am. Oph. Soc., 1890, vol. v. p. 654. | F. | 46 | R........ | ......... | Flat tumor in the macular area. | Right breast, 16 months. | ................ | 12 mos. or more |
| 16 | Uhthoff (2)..... | Internat. Beitr zur wissenschaftlichen Medicin, 1891, Bd. 2. | F. | 47 | R. and L. | R. Tn....<br>L. Tn.... | Flat tumor in the chorioid and sclera of both eyes. Retrobulbar deposit. | Right breast, 9 months. | R. temporal lobe, lung and abdominal organs. | 1½ mos. |
| 17 | Wagner, C..... | Ueber Metastatische Aderhauttumor, by S. Schroeter, Halle, 1891. | M. | 45 | L........ | T. + .... | Flat tumor in the chorioid; 2 mm. thick. Clinical only. | Liver ....... | Glands of neck, axilla and groin. | 24 mos. |
| 18 | Holden W.A.,1st | Archives of Ophth., 1893, xxi, p. 76. | ... | .. | ......... | ......... | 3 flat tumors in chorioid. Epibulbar deposit. | "Clinical history lost." | | |
| 19 | Schultze, S., 2d | Archiv f. Augenhk., 1893, Bd. 26, S. 19. | F. | 39 | ...... ... | ......... | Detached retina. Extra scleral tumor as well as chorioid. | Right lung, 6 months. | Abdominal organs. | 7 mos. |
| 20 | Abelsdorf, G.... | Archiv f. Augenhk., 1896, Bd. 33, S. 34. | F. | 41 | R. and L. | R. Tn....<br>L. Tn... | Detached retina. Entire chorioid and into ciliary bodiy, iris, optic nerve and sclera. | Right breast, 1 year. | ................ | 4 mos. |
| 21 | Noyes, H. D.... | Trs. Am. Oph. Soc., 1897, p. 538. | F. | 55 | R........ | T. — .... | Detached retina. Thin, flat tumor in the chorioid. | Right breast, 15 years. | ................ | 11 mos. |
| 22 | Matthewson, G. H. .......... | British Med. Ass'n, Montreal Meeting, 1897. | F. | 48 | R........ | ......... | Flat, rough adenocracinoma in the chorioid. Invasion, optic nerve and sclera. | Thyroid .... | ................ | 3 mos. to enucleation. |
| 23 | Marshall, C. D., 1st .......... | Roy. Lon. Oph Hos. Reports, Dec, 1897, p. 415. | F. | 57 | R........ | Tn. ..... | Flat tumor in the posterior chorioid. Invasion optic nerve. | Right breast, 17 months. | Abdominal organs. | 5 mos. |
| 24 | Marshal, C. D., 2d .......... | Ibidem .................... | F. | 41 | R. and L. | R. Tn....<br>L. Tn.... | Tumor about optic disc in each. Clinical only. | Breast, 18 months. | ................ | 8 mos. |

J. H. Parson's List, Royal London Ophthalmic Hospital Reports, vol. xv, an., 1903, p. 86, adds 9 cases.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 25 | Samelsohn .... | Deutsch med. Woch., xvii, 1891, S. 927. | F. | 43 | L........ | ......... | Detached retina. Extraocular growth. Flat tumor chorioid. | Breast, 2 years. | Lungs, pleura and orbit. | 14 mos. |
| 26 | de Schweinitz, Geo. E., 1st.. | Trs. Am. Oph. Soc., 1898, p. 313. | F. | 40 | R........ | Tn. ..... | Flat tumor in macular area.... | Left breast, 7 months. | Brain, cervical, clavicular and axillary glands. | 4 mos. |
| 27 | de Schweinitz, Geo. E., 2d.. | Ibidem .................. | F. | 43 | L........ | ......... | Clinical only.................... | Left breast, 2 years. | Other breast... | |
| 28 | von Michel..... | Intern. Opht'l Cong., Utrecht, 1899. | F. | .... | ......... | Tn. ..... | Intra chorioidal. Extra bulbar carcinoma. | Ant. mediastinal glands. | Hodgkin's disease. | |
| 29 | Rowan, J....... | Trs. Oph. Soc., U. K., xix, 1899, p. 103. | M. | 55 | L........ | Tn. ..... | Detached retina. Glaucoma. Discoid tumor, chorioid. | Lung ...... | Cervical glands. | 4½ mos. |
| 30 | La Grange, F., 1st .......... | Archiv d'Ophthal. xviii, 1898, p. 30. | F. | 48 | R........ | T. + 1... | Detached retina. Tumor in temporal area chorioid. Also in iris and sclera. | Breast, 2 years. | ................ | 2 mos. |
| 31 | La Grange, F., 2d .......... | Tumeurs de Locil, vol. 1, p. 512. | M. | .... | R........ | ......... | Intra chorioidal. Very large extra ocular growth. Invasion of ciliary body. | ............. | ................ | |

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|---|---|---|---|---|---|---|---|---|---|---|
| 43 | Brewitt, F., 1st | Inaug. Diss. Goettingen, 1903. | F. | 52 | R. and L. | ......... | Flat tumors of chorioid—both eyes. | Right breast, 10 years. | L. breast, lower jaw, glands of neck and axilla. | 12 mos. |
| 44 | Brewitt, F., 2d. | Ibidem .................. | F. | 53 | R. and L. | ......... | R. "knobby" flat tumor, chorioid and forward into ciliary body. L. Flat tumor. | Lung ....... | Abdominal organs. | 3 mos. |
| 45 | Reis, W......... | Klin. Monatsbl. f. Augenhk., xli, 1903, S. 411. | M. | 59 | L........ | T. + 3... | Detached retina. Glaucoma. Adenocarcinoma. | Stomach.... | Brain and peritoneum. | "Few months." |
| 46 | Greenwood, A., and Southard, E. E.......... | Boston M. & S. J., Sept. 10, 1903, cxlix, p. 287. | M. | 56 | L........ | T. + .... | Two flat tumors in chorioid—fused. | Prostate.... | Bladder, peritoneum, lungs, pleura, pericardium. | "Few months." |
| 47 | Ginsberg, S., 1st | Grundriss Path. Histol des Auges, 1903, p. 293. | M. | 45 | R........ | ......... | Flat tumor chorioid............ | Unknown.... | Cervical glands. | 7 mos. |
| 48 | Ginsberg, S., 2d | Ibidem .................. | M. | 60 | R........ | ......... | Flat tumor chorioid............ | Lung ...... | Skin, pleura, pancreas and kidney. | |
| 49 | Ginsberg, S., 3d | Ibidem .................. | F. | 42 | R........ | ......... | Flat tumor chorioid. Optic nerves involved. | Left breast.. | Skin, orbits and skull. | "Several weeks." |
| 50 | Holden, W. A., and Rusk, G. Y., 2d........ | N. Y. Acad. Med. Ophth. Sect., Jan. '04, Arch. Oph'y, vol. 33. | F. | 35 | L........ | Tn....... | Detached retina. Flat tmuor chorioid. | Ovary ...... | Brain and abdominal organs. | |
| 51 | Coppez, H...... | Arch. d'Ophtal., xxiv, 2, p. 79, Feb., 1905. | M. | 43 | R. and L. | ......... | Many flat nodules under detached retina. Glaucoma. | Cervical glands. | ................ | 8 mos. |
| 52 | Baillart ...... | Recueil d'Ophth., 1904, 3d S. xxvi, p. 329. | F. | 58 | R. and L. | R. Tn....<br>L. Tn.... | Detached retina. Flat tumor chorioid. Clinical only. | Right breast, 3 years. | Brain, medulla, spinal cord and axillary glands. | 3 mos. |
| 53 | Gelpke ........ | Klin. Monatsbl. f. Augenhk., xlii, 1905, Bd. 1 S. 492. | F. | 51 | L........ | T. + 3... | Detached retina. Glaucoma. Nodule in flat tumor 8 mm. high. | Thyroid, 10 years. | Lungs, pleura and glands. | 2 mos. |
| 54 | Weeks, J. E.... | Trs. Am. Oph. Soc., vol. x, May, 1905. | F. | ... | ......... | ......... | Adenocarcinoma of the chorioid. | Lung ...... | Axillary glands. | |
| 55 | Oeller, J........ | Arch. f. Augenhk. lii, 1905. Arch. Ophth'y, xxxvi, May, 1907. | F. | 47 | R. and L. | R. Tn....<br>L. Tn.... | R. Detached retina reattached. Invasion of sclera and epibulbar tissue. L. Detached retina. Chorioid and ciliary body involved. | Right breast, 4 years. | Lungs, pleura, spleen and dura. | 8 mos. |
| 56 | Marbe ........ | Deut. med. Woch., xxxi, 2, 27, July, 1905. S. 1076. | F. | 40 | R. and L. | ......... | Flat tumor chorioid............ | Right breast, 6 months. | Pelvic bones, abdominal organs. | 4 mos. |
| 57 | Kowalewski, R. | Ztschr. f. Augenhk., xv, 1906, S. 249. | F. | 48 | R........ | T. + 1... | Flat tumor chorioid. Temporal side into ciliary body. | Right breast, 4 years. | Posterior lobes of brain, kidneys. | 8 mos. |
| 58 | Thompson, E. S. | N. Y. Acad. Med. Oph. Sect., Jan. '06. Arch. Ophthal'y, xxxv, July, 1906. | F. | 48 | R........ | T. + .... | Flat tumor chorioid. Invasion optic nerve and epibulbar tissue. | Right breast, 3 years. | ................ | 12 mos. |

| No. of Case. | Author. | Where Published. | Sex. | Age. | R. — L. Eye. | Tension of Globe. | Pathological Examination of Eyeball. | Seat of Primary Growth. | Secondary Deposits Other Than Eye. | Duration of Life After 1st Eye Symptoms. |
|---|---|---|---|---|---|---|---|---|---|---|
| 32 | Rockliffe, W. C. | Trs. Oph. Soc., U. K., xxi, 1901, p. 84. | F. | 46 | R. and L | R. T. + .<br>L. Tn.... | Optic neuritis. Intra chorioidal, also ciliary body, optic nerve, sclera. | Breast...... | Pleura, left leg. | 9 mos. |
| 33 | Parsons, J. H... | Roy. Lon. Oph. Hos. Reports, xv. Jan., 1903, p. 286. | F. | 37 | R. and L. | R. Tn....<br>L. Tn.... | Flat tumor in chorioid. Optic nerve involved. | ............ | ................ | |
| E. L. Oatman's List, American Journal of Medical Sciences, vol cli, March, 1903, p. 375. (Figures in brackets are Oatman's numbers.) | | | | | | | | | | |
| 34 (23) | Kaemmerer .... | Corrbl. des allg. Aerzt. Vereins. von Thuringen, 1898, 3, S. 62. | F. | 58 | R........ | ......... | Flat tumor, nodular, in chorioidal network of elastic fibers. | Liver ....... | ................ | "Short time." |
| 35 (24) | Wagenman .... | Ibidem, 1898, 2, S. 31.. | F. | 45 | R. and L. | ......... | Discoid tumor in chorioid. Sclera invaded. | Breast, 1 year. | ................ | 5 mos. |
| 36 (28) | Bentzon, Ch.... | Hospitals Tidente, ix. 1900, 4. | M. | 30 | R........ | T. + .... | Detached retina. Glaucoma. Adenocarc. in chorioid and ciliary body. | Right suprarenal body. | Lungs and mediastinal glands. | 7 mos. |
| 37 (30) | Oatman, E. L.. | Am. J. Med. Sc., cli, 1903, p. 375. | M. | 56 | L........ | T. + 1... | Detached retina. Glaucoma. Adenocarcinoma chorioid, optic nerve and sclera. | Liver ....... | R. lung, kidneys, spleen and glands. | 18 mos. |
| Suker and Grosvenor add the following cases: | | | | | | | | | | |
| 38 | Chevallereau .. | Revue generale d'ophtal., 1898, p. 118. | F. | 38 | R........ | ......... | Detached retina. Flat tumor chorioid forward to iris. | Breast ..... | Intestines, stomach. | 12 mos. |
| 39 | Bajardle ....... | Giornale della R. Ass. di med. di Torino, 1900, p. 447. | F. | 60 | L........ | Tn....... | Flat tumor of the chorioid..... | Stomach.... | ................ | "Several months." |
| 40 | Blessig ........ | St. Petersburg med. Woch., No 31, Aug. 17, 1901. | F. | 35 | R........ | Tn....... | Flat tumor of the chorioid..... | Tracheal and bron. lymph glands; 6 months. | Cervical glands, lungs, pleura, liver and kidney. | 5 mos. |
| 41 | Jack, E. E., and Verhoeff, F.H. | Trs. Am. Oph. Soc. ix, 1902, p. 483. | F. | .... | R. and L. | R.T. + 1<br>L. Tn.... | Detached retina. Flat tumor chorioid. | Left breast, 9 years. | Brain and abdominal organs. | About 12 months |
| 42 | Krukenberg ... | Klin Monatsbl. f. Augenhk., 1903, xli, S. 145. | F. | 42 | L........ | T. + 1... | Detached retina. Flat nodular tumor chorioid. Cystic degeneration. | Left breast.. | Lungs ......... | 8 mos. |

| No. of Case. | Author. | Where Published. | Sex. | Age. | R. — L. Eye. | Tension of Globe. | Pathological Examination of Eyeball. | Seat of Primary Growth. | Secondary Deposits Other Than Eye. | Duration of Life After 1st Eye Symptoms. |
|---|---|---|---|---|---|---|---|---|---|---|
| 59 | Uhthoff, 3d..... | 33d Oph. Gesellsch. Heidelberg, 1906, Arch. Ophthal'y, xxxvi, 1907, p. 268. | F. | 54 | R. and L. | ......... | R. Reattachment of detached retina. Invasion of both ciliary bodies. L. Confluence of several foci. | Left breast.. | Brain, spinal cord, neck glands, axilla, thyroid, sternum, lungs. uterus. | 3 mos. |
| 60 | Whitehead, A.L. | Trs. Op. Soc. U. K., xxvii, 1907, 161. | F. | 31 | R........ | T. + 2... | Detached retina. Glaucoma. Tumor forward to ciliary body. | Right breast, 9 years. | Scars in breast and axilla. | 3 mos. |
| 61 | Ginsberg, S.,4th | Personal letter, Aug. 9, 1908. | F. | 50 | R. and L. | R. Tn....<br>L. Tn.... | Choked disc in both, going on to atrophy. Flat tumors in chorioids. | Breast ..... | Brain, dura, skin. | "Several months." |
| 62 | Sutphen, T. Y.. | Personal letter, Aug. 25, 1908. | F. | 33 | R........ | .......... | Detached retina. Clinical only. | Right breast, 2 years. | Glands all over body. | 8 mos. |
| 63 | Leber, Theo.... | Personal communication, Sept. 29, 1908. | F. | 61 | L........ | T. + .... | Tumor in chorioid and ciliary body. Detached retina. Epibulbar growth. Glaucoma. | Right breast, 6 years. | In and about cicatrix of breast operation. | |
| 64 | Suker, G. F., and Grosvenor, L. N..... | Trs. Am. Acad'my. Oph. and Oto-Laryn., Aug., 1908. | F | 47 | L........ | T. + .... | Detached retina. Flat tumor chorioid. Invasion optic nerve and epibulbar tissue. | Left breast, 2 years. | Axillary glands, skin of scapular region, lungs. | 10 mos. |

## RESUME OF THE TABLE OF CASES.

Sex—Males 14, females 48, not stated 2. Age—Between 20 and 30 years, 1; between 30 and 40, 14; between 40 and 50, 23; between 50 and 61, 21; not stated, 5. Average of 58 cases is 45.72+ years. Eyes—Both involved in 20 cases, right in 21, left in 20, not stated in 3. Tension—Normal in 30 eyes, plus (+) in 22, minus (—) in 4, not stated in 28. Seat of Primary Invasion—Right breast in 20 cases, left in 12, "breast" in 7, making a total of 39. Lung 6, stomach 4, liver 3, thyroid 2, 1 each, mediastinal glands, tracheo-bronchial glands, cervical glands, suprarenal gland, prostate, ovary; not stated, 4.

Time elapsed between first involvement of eye and death—In 48 cases an average of 7 months. In 16 cases the time mentioned is too indefinite or not specified at all.

It is not the purport of this study to theorize as to the etiology of carcinoma or offer any definite views on the various mooted questions which are at present engaging the thoughts of pathologists.[1] Our studies, furthermore, are based exclusively on intraocular carcinoma and its clinical differentiation from sarcoma. We have even restricted ourselves more specifically in so far that we only considered such carcinoma and sarcoma as are either metastatic or primary within the chorioid. We do not consider any reference to or cases of these malignant growths, either primary or secondary, in the iris and ciliary bodies. However, it may be stated that several cases are recorded of primary carcinomatous metastases in the ciliary body and iris.[2] These two structures are not uncommonly involved, however, only by direct extension or tertiary metastasis from the chorioidal carcinoma.[3]

## GENERAL CONSIDERATION.

In an analytical study of endo-ocular tumors, irrespective of their specific nature—whether primary or metastatic—one is forcibly struck with the paucity of endo-ocular carcinoma. A primary carcinoma of the endo-ocular tunics has up to the present day never been seen or reported;[4] this for the reason that within the globe there are no histologic cells in which a carcinoma per se could engender. Therefore, any carcinomatous involvement of intraocular tunics must be a metastasis. Per contra a metastatic intra-ocular sarcoma is just as rare as a primary carcinoma. The case or two of the former reported in literature bearing on either of these two latter points are open to serious objections in each instance, namely, a failure to get a complete clinical or pathological[5] examination of the case or specimen.

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[1] A view of the origin of carcinoma which is gaining credence is that of Ribbet's (Deut. med. Wohnschr., No. 31, 1905) that carcinoma originates in epithelial cells over which the body has lost control; the cells proliferate independently and at the expense of the body. He has demonstrated changes in subcutaneous tissue or vessels from local arteriosclerosis markedly inhibiting blood supply and finally shutting off the epithelium above from the direct control of the rest of the body. Roentgen cancers are a good example of this type, the infiltration of the subcutaneous tissue and papillary layer of the corium occluding the capillaries and gradually shutting off the epithelium from the blood supply. As long as the body is capable of responding with the new vessel formation and capillary growth the epithelium is not entailed, but as age advances, this property is lost and the epithelial cells gradually become excluded from the rest of the body. Epithelial cells have a peculiar power of independent existence, more so than any other kind of cells, witness detached epithelial grafts. Wyss (Deut. Ztschr. f. Chirurgie, July, 1903, No. 6, pp. 505-587) upholds the same view.

[2] A research of the literature reveals the following cases:

Badal and LaGrange: Arch. r'Ophtal., March, 1892, vol. 12, p. 3; Teacher Collins: Trs. Oph. Soc. U. K., 1894, vol. 14; Brewitt: Arch. d'Ophtal., 1896, vol. 18, p. 30; Briehn: Dissert. Königsberg, 1902; Uhthoff: Deut. med. Wchnschr., 1904, No. 39; Cutler: Trs. Am. Oph. Soc., May, 1905, vol. 10; Stock: Klin. Monats. Augenhk., 1905; Proctor and Verhoeff: Arch. Oph., January, 1907.

[3] Cases in our list which show ciliary body and iris involvement either by direct extension, continuity or invasion: Numbers 12, Ewing; 20, Abelsdorf; 30, LaGrange; 31, LaGrange; 32, Rockliffe; 36, Bentzon; 38, Chevallereau; 44, Brewitt; 55, Oeller; 57, Kowalewski; 59, Uhthoff; 63, Leber.

[4] Primary carcinoma of the brain, with chorioidal metastasis has never been recorded; although in several carcinomata of the brain, choked disc supervened as in any other brain tumor. In 17 of our cases there were metastatic foci in the brain.

ORGANS AND INTRAOCULAR TUNICS INVOLVED.

It is certainly surprising that, although carcinoma uteri is of frequent clinical appearance, intraocular metastases therefrom are correspondingly infrequent. In our series of sixty-four cases not one had the primary carcinoma in the uterus; yet metastases in the uterus from the primary organ were quite frequent.[9] In a careful study of the history of the reported cases and an analysis of the various statistics no warrantable deductions can be drawn why metastases from the uterus should not be at least as frequent as those of stomach, liver and lungs. Several theoretical reasons for this can be assigned; however, as they are only conjectural, we will forgo them.

The carcinomic metastasis by preference invades the chorioid and is brought there as a cardiac embolus. It reaches the temporal region of the eye by way of the ciliary arteries principally, though cases are reported in which it reached the eye by way of the lymph channels.[7] This metastasis remains in general rather closely confined to the first ocular tissue invaded. Very seldom are there several metastatic foci;[8] if so, upon growing they usually coalesce. With a primary metastasis in the chorioid, the iris and ciliary body are most frequently involved by extension or invasion and not by secondary or tertiary metastatic foci.[9] In each instance, though, the growth or extension is nearly always along the paths of least resistance.[10]

The metastasis in the chorioid assumes the characteristics of the primary growth, i. e., medullary, scirrhus or adenomatous.

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[5] In the eye there are no cells in which a carcinoma may originate, whereas there is much connective tissue from which a sarcoma may start.

[7] Brewitt's case, No. 44.

[8] Cases of more than one metastatic focus in the chorioid: No. 11, Schultze; 18, Holden; 46, Greenwood and Southard; 51, Coppez; 59, Uhthoff.

[9] Cells often get loose in the intrabulbar space and wander by way of the lymph stream to other parts of the eye, upon being deposited give rise to local metastases. In this way tertiary deposits are found in the angle of the anterior chamber (Abelsdorf, 20; Michel, 28) or even get in between the ciliary processes. (Michel.). See Note 3.

[10] The extension of carcinoma, here as elsewhere, is very characteristic, usualy insinuating itself between the fibers of the structures it meets rather than breaking through them.

In a good many instances these three types are manifested in an individual metastasis; however, the characteristics of the primary growth predominate. This fact is particularly exemplified in a metastasis from the liver in the chorioid in which the typic liver cells, alveoli, and biliary pigment were observed (Bock's case).[11]

[11] Bock's case: There was a definite tumor, deep green in color with large polygonal and cylindrical cells arranged in a manner like liver cells; the lumina contained bile and gave the reactions for biliverdin; the liver, skin, lungs, muscles, orbit and arachnoid were involved. Wintersteiner (Encyclop. d. Augenhk., Leipzig, 1902) classified it as a metastatic carcinoma, primary in liver, though Bock regarded it as an adenoma. (Bock: Virchow's Archiv., xci, 1883.)

The only intraocular tumor for which metastatic chorioidal carcinoma can be mistaken is a flat sarcoma or so-called endothelioma, and this, by preference, is in the ciliary body and rarely in the chorioid, and is, in addition, of rare occurrence.

The breast seems to be the most usual seat of the primary carcinoma. In this series 39 such cases are reported, 20 in the right, 12 in the left breast, in 7 the right or left breast was not specified. Following the breast in frequency are the lungs with 6 cases, then the stomach with 4, the liver 3, finally the anterior mediastinal glands and thyroid with 2 each. Observe that the above organs are next, with the exception of the breast, in order of frequency to carcinoma of the uterus. Primary carcinoma of the breast and uterus or cervix are nearly of like frequency. Rather unusual seats for primary carcinoma are the following organs, of which one each is found in this series of 64 cases: suparenal body, prostate and ovary.[12]

[12] Bentzon (No. 36): Found primary carcinoma in the right suprarenal body at the autopsy. Greenwood and Southard (No. 46): Male, primary in prostate. Holden and Lusk (No. 50): Insane woman of 35; autopsy showed primary carcinoma in ovary.

This analysis of the primary seat of the chorioidal metastasis of carcinoma compares favorably with and is about on a par with the sarcomatous metastases occurring in these other various distant organs when the primary sarcoma is in the chorioid. It is unnecessary to quote statistics or data in this behalf, as they are all too familiar to us.

### AGE AND SEX.

This being the largest statistical report on chorioidal metastatic carcinoma, it will serve better to calculate averages than any heretofore. We find the average age of appearance is 45.72 years in 59 cases, whereas Oatman in his list of 30, found it to be 44.37. Hence we can fairly well assert that the chorioidal metastasis is prone to occur between the fourth and fifth decade. In 5 cases the age was not given. The youngest on record is a female of 28 and the oldest a female of 61. In reference to age, sarcoma appears more often at about 30, while the sex proportion is about the same, if anything favoring the male (Wood and Pusey's Primary Sarcoma of the Iris, *Arch. Ophthal.*, 1902, xxxi, 4).

As to sex, there were 48 females and 14 males, with the sex of two not specified. It, therefore, occurs more than three times as often in the female as in the male (3 3/7). Oatman found the proportion 2 to 1. This large percentage of females is accounted for by the fact that the majority of primary carcinomata were in the breast and is not due to the difference in sex as such.[13]

In Wood and Pusey's series of 96 cases of primary sarcoma of the iris there were 42 females and 52 males, with a very large percentage under the age of puberty, a very significant fact in regard to sarcoma. If this percentage is true for the anterior segment of the globe as pertains to males, it is not quite so marked for the posterior segment, as we all well know.[14]

## SITE AND CHARACTER OF THE TUMOR.

As the carcinoma is a pure metastasis in the eye, brought there as a cardiac embolus, we need not marvel greatly why it is usually lodged in the posterior half of the globe. For after the embolus once enters the ophthalmic artery it, by preference, enters the ciliary rather than the centralis, as the former does not leave the ophthalmic at nearly as much of a right angle as the centralis. An embolus usually takes the current of greatest velocity and also usually occupies the center of the current, hence would naturally get into a vessel that does not leave another at right angles. Any metastasis from the abdominal cavity must go by way of the vascular route in order to reach the eye, as there is no direct lymph channel from these cavities to the eye or orbit. Most often the embolus enters the eye by way of the posterior ciliary arteries. In one instance (Biehn's case[15]) the embolus was lodged in the iridociliary region and hence must have been carried there by way of the anterior ciliary artery. The lodgment of the embolus in the immediate macular area with the resulting retinal detachment accounts for the rapid loss of vision as the tumor progresses in size.[16]

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[13] American Journal of the Medical Sciences, March, 1903.

[14] It is impossible to be absolutely certain that sarcoma of the chorioid is always a primary growth. Elschnig (Arch. f. Augenhk., xxii, 1891) holds the opposite view, though the preponderance of evidence is in favor of the primary growth. Metastatic sarcoma of the chorioid has been reported by: No. 1, Bromser. Inaug. dissert., Berlin, 1870; No. 2, Schiess, Gemuseus and Roth, Arch. f. Ophthl., xxv, No. 2, 1879; No 3, Pflüger, Arch. f. Augenhk., xiv., 1885. The primary sarcoma in these cases was a nevus on the cheek, over the sternum or over the parotid gland. Bromser's case is questioned because of the inaccuracy of the diagnosis of the primary growth. In Schiess Gemuseus' case the papilla with the adjacent chorioid was involved; and in Pflüger's case no microscopical examination was made. So in these three cases the metastatic nature can rightly be disputed if not denied.

From this point the carcinoma cells rapidly proliferate through the vessel wall and into the interstices of the chorioidal stroma, encroaching upon and destroying the latter and also materially implicating the chromatophores. The tumor cells force their way along the paths of least resistance; therefore, within the meshes of the chorioid. Eventually the tumor assumes a discoid character and gradually tapers off into the normal chorioidal tissue.[17] The tumor is seldom thicker than two or three millimeters at the center and gradually tapers towards the periphery as before stated. It finally encircles the disc and cancer cells can often be seen penetrating at this point into the intraneural lymph spaces and detached retina[18] (Fig. 2). Bruch's membrane and the membrana hyaloidea are seldom perforated, hence carcinoma cells are usually not seen in the retina or vitreous. This is not so with sarcoma, but the reverse obtains most frequently. Numerous hemorrhages within the tumor and in distant chorioidal areas are often seen. Large necrotic areas are frequently observed, often macroscopically recognized by their peculiar yellowish color[19] (Figs. 4 and 6).

The tumor grows more rapidly toward the temporal than on the nasal side, not infrequently crowding upon the ciliary body, processes and iris angle as shown in Leber's case (Fig. 5). Local secondary metastases are not usual; fortunately, the adjoining tissues and structures are involved rather by direct extension and continuity of tumor cells. In many cases the carcinoma cells penetrate the sclera by ramifying between its fibers. Rarely do they perforate the sclera. Many cases show extra bulbar growths, but these are not due to perforation but rather to metastases from the chorioid by way of the ciliary vessels and nerves.[20]

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[15] Malignant emboli have been seen in the anterior ciliary artery (LaGrange case, No. 31). In Biehn's case there certainly was either a malignant embolus here or due to one in the long posterior ciliary artery. This latter was a metastatic carcinoma of the ciliary body and iris (Dissert., Königsberg, 1902).

[16] The ciliary body is usually involved by continuity or by tertiary and rarely by secondary deposits. The iris is similarly involved, but whether by continuity or by the blood or lymph channels is difficult to positively determine.

[17] The three layers of the chorioidal blood vessels, that have been more or less replaced or displaced by the carcinoma cells, now resume their normal relations as the tumor cells gradually taper off. The limiting membranes remain intact.

[18] Invasion of the retina in five cases: No. 4, Hirschberg and Birnbacher; 31, LaGrange; 29, Rowan; 37, Oatman; 64, Suker and Grosvenor.

[19] Bruch's membrane usually remains intact. In one of Ginsberg's cases it was broken. If this occurs, the tumor assumes a globular form. Gelpke, 53, reports a tumor of "hazel nut size," protruding into sub-retinal space.

[20] Extra bulbar growths, Nos. 11, Schultze; 16, Uhthoff; 18, Holden; 19, Schultze; 20, Abelsdorf; 25, Samelsohn; 28, Michel; 31, LaGrange; 55, Oeller; 58, Thomson; 63, Leber; 64, Suker and Grosvenor.

These above tendencies of the carcinoma are directly opposite to those of sarcoma.

The retina at first is only slightly detached, but eventually a rapid and total detachment ensues, except at the disc and ora serrata. The suprachorioidal spaces remain relatively immune.

With the ophthalmoscope, in the beginning, there is a yellowish or grayish white reflex, not revealing many vascularizations or definite details. Soon all details are lost, owing to viterous disturbances and extensive retinal detachment.

The optic nerve is seldom attacked in continuity, the growth usually stopping at the edge of the disc (Fig. 2). The nerve may be partly or entirely replaced by the new growth even as far as the chiasm.[20a]

[20a] (3, Schoeler and Uhthoff: 10, Kamocki; 20, Abelsdorf; 22, Matthewson; 23, Marshall; 31, LaGrange; 33, Parsons; 37, Oatman; 49, Ginsburg; 58, Thomson; 64, Suker and Grosvenor). Optic nerve only was involved in several cases (Elschnig, Arch. Oph., xx. p. 370; Dittrich, Prayer Vierteljahrschr., xii.; Krahn, Zechender's Klin. Monatsbl., x. 103; Holden, Arch. Oph., xxxi., 427).

## TENSION.

There is no unanimity as to whether it is usual during the progress of an intraocular tumor to have increased or decreased tension. More often one encounters a minus tension with carcinoma than with sarcoma. To say that an intraocular growth confined to the chorioid and producing minus tension is not a sarcoma, as Marshall writes,[21] is open to valid objections. We personally have on record several cases of sarcoma with minus

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[21] Marshall (Tension in Cases of Intra-Ocular Tumors, Trs. Oph. Soc. U. K., 1896, vol. xvi, p. 155) concludes from 100 cases:

(a) The size of the tumor has but little to do directly with the tension of the eye containing it until the point is reached when it practically fills the globe or else perforates it. When the latter occurs the rupture is in the position where normally vessels enter or leave the eye.

(b) The course of the increased tension is the same here as it is in other forms of glaucoma, viz., the closure or diminished size of angle of anterior chamber.

(c) It is far more frequent to find the angle closed in sarcomata of the chorioid only than where the growth is farther forward and the ciliary body and iris are affected.

(d) Diminished tension by no means uncommonly occurs when the ciliary body is involved, but I have been unable to find an undoubted case in which the tension has been reduced when the chorioid only is affected.

(e) A majority of the cases of sarcomata affecting the ciliary body have no increase in tension. Of these a few have minus tension and a far larger number show no alteration from the normal.

(f) Most cases of gilomata have normal tension. A few are met having diminished tension and the rest have no evidences of tension. Their anatomical condition following the rule previously mentioned.

(g) Many cases doubtless exist in which the tension varies in different stages of the disease.

(h) In all cases the tension bears a direct relation to the size and condition of the angle of the anterior chamber; when inflammatory changes occur it depends also upon the plastic or serous nature of the fluid contained in the chamber.

TABLE 1.—Sarcomata of the Chorioid not Involving Ciliary Body.

| | No. | Per Cent. |
|---|---|---|
| Increased tension | 36 | 67.92 |
| Normal tension | 16 | 30.18 |
| Diminishing tension | 1 | 1.88 |
| Total | 53 | .... |

TABLE 2.—Sarcomata in which Ciliary Body is Affected.

| | No. | Per Cent. |
|---|---|---|
| Increased tension | 10 | 35.71 |
| Normal tension | 14 | 50 |
| Diminishing tension | 4 | 14.28 |
| Total | 28 | .... |

TABLE 3.—Gliomata.

| | No. | Per Cent. |
|---|---|---|
| Increased tension | 7 | 36.84 |
| Normal tension | 10 | 52.63 |
| Diminishing tension | 2 | 10.52 |
| Total | 19 | .... |

tension. Wood and Pusey, who tabulated 96 cases of primary sarcoma of the iris, encountered one with positive minus tension and several which could possibly be said to have the same also. In our series of carcinoma there were four cases with minus tension, a relatively large percentage.

The point at issue in taking tension is: What degree of intraocular tension constitutes a normal tension? No definite standard has been universally accepted. May not many of the cases recorded as having nearly normal tension be construed as having a virtual minus tension, provided we had a fixed standard of measuring tension? To use tension as a valuable differential diagnostic point in any stage of any intraocular tumor—whether same be in chorioid, iris, ciliary body or retina, is not warrantable. The element of tension depends largely upon the extent of the tumor and its so-called inherent pernicious activity and its relative location to the filtration angle of the eye. The nearer the filtration angle and greater the encroachment in addition to the intensity of pressure exerted by tumor on the chorioidal venae vorticosa and the greater the amount of so-called tumor secretion, the sooner does tension ensue.

In this series of 64 cases the tension was noted as follows (at time of first examination): Increased in 22, decreased in 4, normal in 30, unrecorded in 28. In all there were 84 eyes involved in the 64 cases. In looking over the table one notices that increased tension, both early and prolonged, usually accompanied a large cancerous implication rather than a smaller one. In each instance the tumor extended well toward the filtration angle. We fail to see of what clinical significance tension is in determining therapeutic measures when dealing with intraocular sarcoma or carcinoma. However, it is quite significant that in bilateral intraocular carcinoma the tension was uniformly raised.[22]

[22] Of the bilateral cases, 8 had normal tension in both; 1, tension + in both; 3 tension + in the right and normal in the left; 1, tension — in left, normal in right. In 7, tension was unknown. We can reasonably assume an increased tension in some of the latter seven making the percentage significantly high. In single eyes involved tension was + in 15.

The relatively large proportion of minus tension—4 out of 84 eyes—is not to be lost sight of in connection with the fact that in about 99 of 100 cases of sarcoma it is increased. If tension is to be assigned more significance than it at present holds, cases of chorioidal carcinoma must be studied early and often, for the patient usually succumbs within seven to eight months after the first eye symptoms are manifested. This short duration of life after ocular involvement does not hold true for sarcoma. The growth of sarcoma is relatively slow as compared with that of carcinoma, hence tension is not so prone to develop early.

In many of the cases tension first develops subsequent to total detachment of the retina, excessive dragging or pressure on the filtration angle in addition to the practical obliteration of the vitreous. All of these conditions obtain in rapid succession in chorioidal metastasis. In our case the iris angles are obliterated by the crowding forward of the iris, lens, ciliary processes and retina due to the pressure of this large amount of subretinal fluid. This condition, probably, frequently accounts for the increased tension in some of the other cases. May not some of the conditions—perhaps purely physical—which allow a brain tumor a certain latitude without producing pressure symptoms be taken into consideration when speaking of intraocular tension caused by a tumor? In the brain there are certain filtration angles similar to those in the eye.[23] Brain tumors do not always cause increased intracranial pressure, and neither do intraocular tumors. May not investigations along these lines be productive of some good?

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[23] Foramen magnum, optic and olfactory nerve sheaths and the ventricles.

### RETINAL DETACHMENT.

The rapid loss of vision in these cases is largely to be ascribed to the early and rather extensive retinal detachment. This detachment is more extensive in carcinoma than in sarcoma. The detachment is due to a combination of circumstances: (a) interferences with the chorioidal circulation (Graefe, Fuchs); (b) secretion of an albuminous fluid from the carcinoma cells and necrobiotic material due to pressure in the immediate structures; (c) shrinking, detachment and degeneration of the vitreous. In several instances the three factors were extensively operative.

The detachment in the early stages is more like a flat detachment because of the nature of the growth of the tumor—flat or discoid-like—and not as in sarcoma—globular, or like our friends across the water term "knobby." In Wintersteiner's case there is a complete detachment of the retina, although there are but two small nodules of metastatic carcinoma in the chorioid (Fig. 6). In the early stages the retina over the site of the tumor is uniformly elevated and frequently confined to the tumor area, while with sarcoma the detachment may be at several points in addition to that over the site of the tumor. Ultimately in each a total retinal detachment is to be expected. However, in some few instances a reattachment of the retina did take place for a time being." This occurrence, however, is relatively rare in either variety of tumor.

24. Reattachment of detached retina noted by Oeller (55) after many operative procedures, but became detached after several weeks of good vision. Uhthoff (59) reports a spontaneous reattachment of a detached retina.

One characteristic of the carcinoma cell is that it does not invade the retina as extensively as one would suppose[25] (Fig. 2).

25. The flat sarcoma follows the path of least resistance, as does the carcinoma. In both the cells lie between the planes of the chorioidal structure, along the lymph spaces.

Carcinoma cells if they do penetrate the retina do so at the disc margin rather than elsewhere. Another feature is a relative small amount of subretinal fluid in the early stages. It is less abundant than in sarcoma of corresponding size and age.

### THE MANNER OF ENTERING THE EYE.

The primary metastasis is carried to the eye most often by way of the posterior ciliary arteries as a cardiac embolus. It enters the second eye by the same route. In two instances (Ewing, 12, and Wagenman, 35) the metastatic invasion of the second eye occurred months after the removal of the first eye. Therefore, the view of Manz and Wagner, that the cancer cells migrate from one eye to the other by way of the lymph channels of the optic nerve tract, does not seem very feasible. For if this were so, then the metastasis would by preference develop in the papilla and no such case has ever been recorded. Schultz[26] ventured this idea and our series of 64 cases with no papillary metastasis is rather an ample verification of this contention.

There is no authentic case on record in which the metastasis entered the eye by way of the arteria centralis retinae. At least none could be found in this series of 64 cases, and no mention is made of its involvement in the microscopic examination of the enucleated globes. In one or two instances the posterior ciliary artery was found to be completely occupied by cancer cells, and in portions thereof the vessel walls had been destroyed and the endothelium replaced by cancer cells. Nevertheless, the fact still remains that carcinoma metastasis or cell migrates preferably by way of the lymph channels. However, only in a general carcinomatosis or in an organ excessively involved do the cells emigrate by way of the blood vessels (this can be seen in our specimen). At times one can see the carcinoma cells penetrate the vessel walls from without.[27]

It is seldom that both eyes are simultaneously involved. Usually a brief period of time intervenes. In about one-third of the cases both eyes are involved. This percentage agrees with that of Marshall, Parsons and Oatman. In this series of 64 cases 20 were bilateral, 21 limited to the right eye and 19 to the left, while in 3 cases the particulars in this behalf were not stated. This bilateral tendency of carcinoma is in marked contradistinction to the uni-laterality of sarcoma, while with reference to the proportion of right or left eye, the percentages for sarcoma and carcinoma are virtually the same. Bilateral sarcoma is extremely rare, while with carcinoma it is of frequent occurrence, 20 in 64.

In this connection it may be said that we do not accept the theory as proven that a cardiac embolus enters by preference the left common carotid, thus the left eye is more often invaded than the right. The differential proportion of 21 right and 20 left is not great enough to warrant such a bold assertion, and particularly so when we take cognizance of the fact that the ophthalmic artery leaves the internal carotid at right angles and the arterio centralis retinae at nearly right angles from the ophthalmic, while the ciliary leaves the ophthalmic at an angle of about 35 degrees. The momentum of the carcinoma embolus in the carotid would tend to carry it by the ophthalmic because the latter leaves the former vessel at right angles. But when the embolus once enters the ophthalmic it is more apt to enter the ciliary than the arteria centralis because the former is not given off at right angles. Then, too, the large proportion of bilateral metastasis, namely, 20 out of 64, would not tend to substantiate this assumption of the more direct blood current. It is as Oatman verily says,[28] "No satisfactory explanation has yet been offered of the fact that this extremely rare metastasis occurs in one eye; the other eye is practically liable to a similar invasion"; and we emphasize the fact that we offer the same view. ". . . . No satisfactory explanation has been given" for the supposed predominance of invasion of the left over the right eye.

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[26] Cases of Rockliffe, 32, and Thomson, 58, suggest the possibility of invasion by the central artery of the retina on account of the extensive replacement of optic nerve structure by the carcinoma cells.

[27] This is a very plausible reason for the occurrence of hemorrhages in the tumor masses.

### PROGNOSIS.

The prognosis is absolutely discouraging. The average length of life after the first recognition of the chorioidal metastasis is approximately seven months. In 48 cases the total number of months which the patients survived was 336, or exactly seven months; in 16 the period of time stated was rather indefinite, such as "short time, few months, several weeks." One case (17, Wagner) survived two years after the recognition, but there is some question as to the accuracy of the clinical history. Eleven cases survived about one year after the eye invasion. This certainly is a gloomy prognosis when compared with chorioidal sarcoma causing general metastasis. In sarcoma usually several years may intervene before a metastasis occurs, either local or general.[29]

A justification for an enucleation does not exist for carcinoma of the chorioid as it does for sarcoma. The former is already a definite and positive proof of the general systemic involvement, as the carcinoma is not a primary growth in the eye. Just the reverse obtains for sarcoma, as we well know. An early and complete enucleation for sarcoma, therefore, is of material benefit, as it very frequently avoids either local or general metastasis.[30]

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[28] Page 13 of reprint, Am. Jour. of the Med. Sciences, March, 1908.

[29] Wood and Pusey say as regards the life of the patient, the prognosis in iris sarcoma is the same as in all sarcoma. Arch. Oph., 1902, xxxi., 4.

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[30] In looking over the case histories one can not but help recognizing the fact that an enucleation oftimes hastens the exitus.

In several instances the eye gave the first definite clew of the carcinomatous involvement. In these cases the removal of the eye apparently hastened the activity of the primary growth and led to an early death. Therefore, one wants to exercise exceeding care in order to ascertain the location of the primary growth when one observes a flat tumor in the chorioid.

To enucleate the eye to prevent the carcinoma from perforating the globe and involving the orbit is a sheer fallacy. Carcinoma scarcely shows a tendency to perforate the globe, while sarcoma evidences a strong tendency.

An enucleation in these carcinoma cases is only indicated for the relief of pain and for no other purpose, as it in no way hinders or checks the fatal progress of the disease. This dictum needs no explanation when we realize that the eye implication is but a secondary manifestation to a rather generalized and evidently fatal carcinomatosis.

In two cases (Ewing, 12, and Wagenman, 35) the remaining eye became involved one month after the enucleation of the other eye. The removal, then, of the eye having the metastatic carcinoma of the chorioid does not preclude the occurrence thereof in the other; at least, such is a warrantable conclusion, judging from the history of the cases.

## MACROSCOPICAL PATHOLOGICAL REPORT.

The eyeball is of the average normal size and shape. In the epibulbar angle formed by the sclera and optic nerve, on the temporal side, is a mass of tissue closely adherent.

The iris and lens are crowded forward, almost obliterating the anterior chamber. The viterous is absorbed and the collapsed hyaloid membrane lies back of lens. The retina is separated from the chorioid by the albuminous exudate from the tumor and lack of resistance of viterous; hence, the retina is totally detached, except at the ora serrata and optic nerve. From all sides the detached retina stretches straight forward from the optic nerve almost to the posterior capsule of the lens, where it separates and turns to the side, paralleling the posterior surface of the lens over to the ciliary body, then back along the side of the ciliary body to its attachment at the ora serrata (see Fig. 1). Back of the retina is a clear homogeneous jelly-like fluid filling the subretinal.

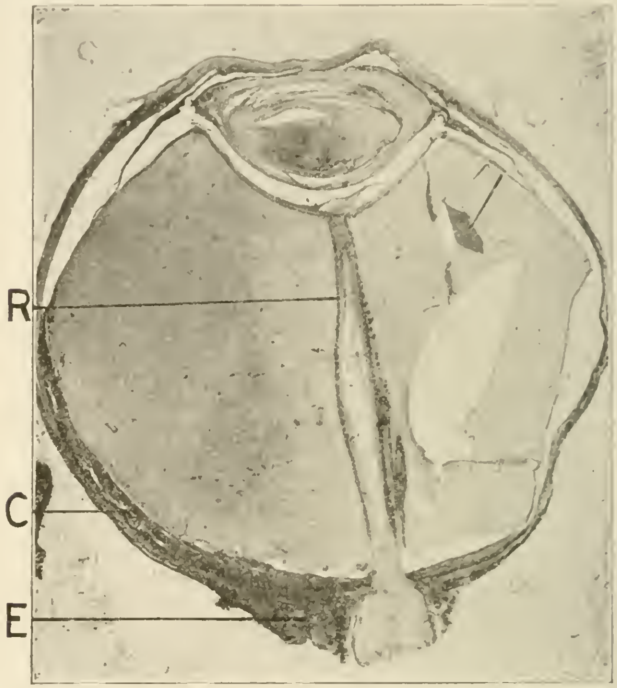


Figure [illegible].

Eye ball. Cross section. C—Carcinoma of the chorioid; R—Detached retina; E—Epibular tumor.

The chorioid is greatly thickened, being more than 2 mm. in thickness at the macular region, gradually thinning off to normal chorioid. On the temporal side the thickening extends two-thirds of the distance around to the ora serrata and on the nasal side one-third the distance.

### MICROSCOPICAL EXAMINATION.

The cornea has become irregularly flattened and there are several abrasions of the epithelial cells. These conditions are doubtless due to the handling and hardening processes of preparation; hence artefacts.

The anterior chamber is obliterated. The atrophic iris is crowded forward and in contact with Descemet's membrane throughout its extent. The lens is crowded forward against the iris and cornea. A portion of the pigment layer of the iris is adherent to the anterior capsule—a total synechia.

The ciliary body is greatly compressed and the ciliary processes are crowded up and forward against the ciliary body and posterior surface of the iris.

Posterior to the lens the membrana hyaloidea, empty of vitreous, lies collapsed anterior to the detached retina. The retina is totally detached from the chorioid by the albuminous exudate. From all sides the retina stretches straight forward from the optic nerve to the crumpled mass of hyaloid membrane back of the lens.

Here the retina spreads out, following closely the posterior surface of the lens, over to the ciliary body, where it extends back along the pars plana of the ciliary body to its attachment at the ora serrata

The retina retains its normal structure, with the exception of the rods and cones, which have become so degenerated that they will not take the Mallory reticular stain.

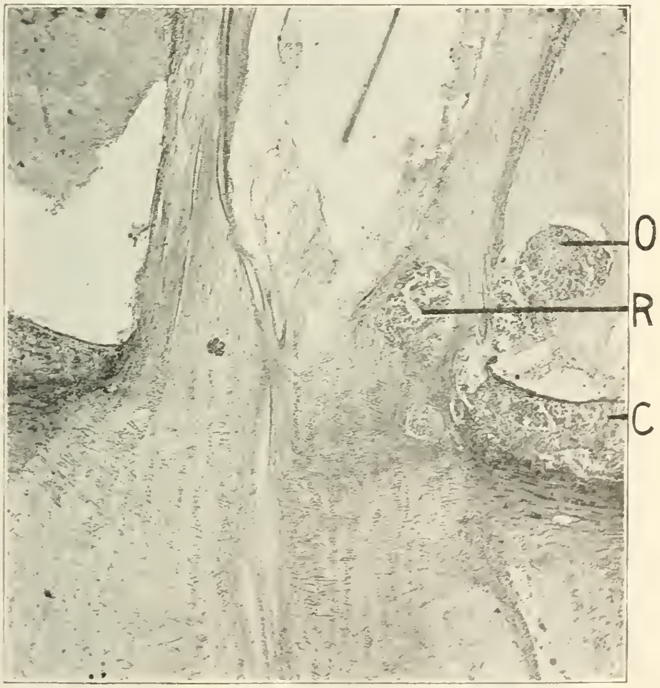


Figure 2.

Optic nerve and retina. O—Carcinoma in subretinal space; R—Carcinoma in detached retina; C—Carcinoma in the chorioid.

The subretinal space thus formed is completely filled with a homogeneous mass which stains a solid pink with eosin. Some of the pigment cells still retain their attachment to the retina, while more are in contact with the inner surface of the lamina vitrea of the chorioid. This lamina vitrea is intact throughout and presents a slightly undulating surface.

The lamina suprachorioidea, the outer limiting membrane of the chorioid, is broken through in many small points by the tumor cells, allowing them to infiltrate the lymph spaces of the sclerotic (see Fig. 3).

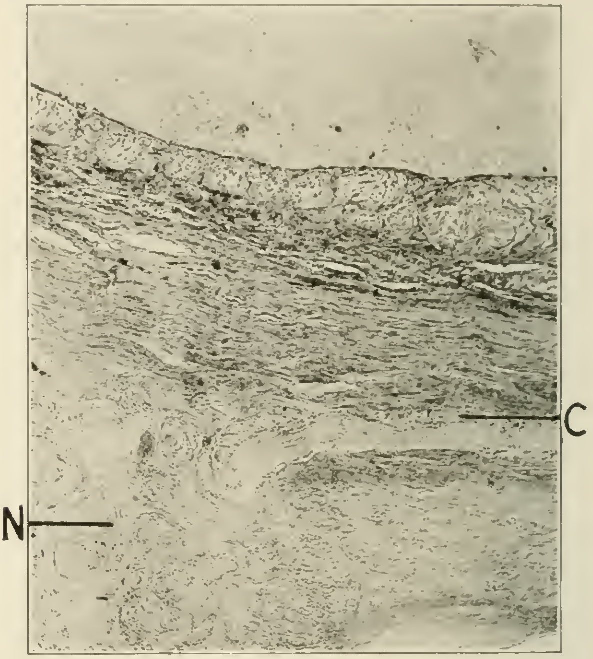


Figure 3.
Sclera and epibulbar tumor. C—Carcinoma in the perineural lymph spaces of long ciliary nerve; N—Cross sections of nerves and carcinoma.

These limiting membranes of the chorioid above described are widely separated, in a parallel manner, by a mass of typic carcinoma cells. The tumor mass surrounds the optic nerve and extends, on the temporal side, two-thirds of the distance to the ora serrata and on the nasal side one-third this distance. The plateau of this tumor reaches its extreme thickness of 2.5 mm. in the macular region. From this point it gradually thins out and finally loses in the normal chorioidal stroma.

The elastic and connective tissue network of a normal chorioid is almost indistinguishable, but in this case of metastatic carcinoma of the chorioid, as in all forms of carcinoma, the malignant growth has been preceded by certain constant changes. These changes are characterized by the presence of plasma cells and lymphocytes, while the other cellular elements remain quiescent. There is a loss of elastin and collagen from the sustentacular framework. Later the epithelial cell proliferation appears and as a result of this there is a most extensive proliferation of connective tissue cells. The cellular elements of the specialized structures and yellow elastic fibers undergo atrophy and the white fibers, connective tissue, become condensed and greatly augmented.[31]

[31] Bonney: Lancet. May 16, 23, 30, 1908.

In the outler layer the carcinoma cells are intensely crowded and compressed, due to the scleral resistance. These outer layers of cells, consequently, stain much more deeply with the hematoxylin than the inner and less crowded tumor cells.

The hypertrophied connective tissue cells make a large and irregular spaced framework for the imbedding carcinoma cells. These spaces are chiefly lymphatic spaces connected with the supra-choricidal lymph spaces. Many chromatophores, in various stages of degeneration, are found in these connective tissue bands.

A large percentage of the chorioidal vascular supply has been encroached upon and compressed by carcinoma cells, practically

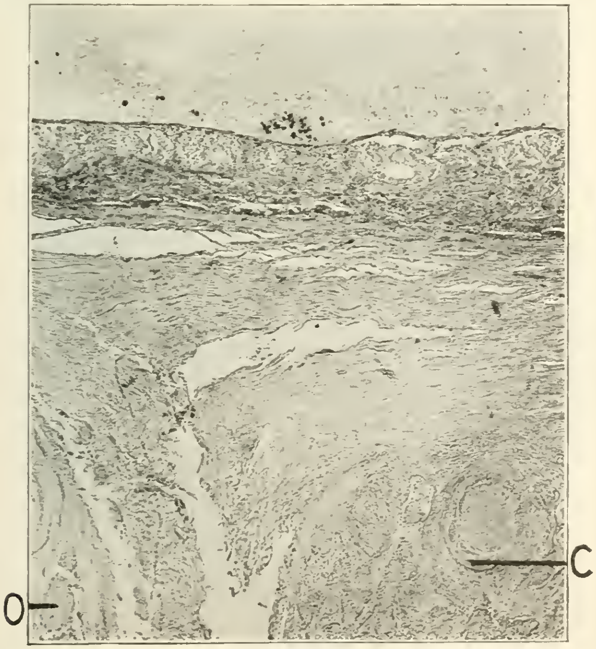


Figure 4.

Epibulbar tumor. C—Carcinoma in perineural lymph spaces of ciliary nerves; O—Carcinoma in optic nerve.

obliterating their lumen. Occasionally a chorioidal vessel is so completely filled with tumor cells as to effectually displace the vessel content; at the same time these cells can be seen passing into and through the vessel walls. Then, again, certain vessels are completely surrounded and compressed by the carcinoma cells. In such instances the tumor cells frequently penetrate the vessel wall from without and mingle with the blood corpuscles. This latter condition may account for the numerous hemorrhages.

There are numerous hemorrhagic areas. These are of irregular shape and size and are made up, in some places, of blood corpuscles only. In others a mixture of blood corpuscles and carcinoma cells. These blood clots are closely surrounded by carcinoma cells and have become more or less necrotic.

In the compact tumor cell masses near the sclera, there were found minute confluent necrotic foci, due to extreme pressure of proliferating cells up against the resisting sclera. In the clumps and nests of carcinoma cells there are larger necrotic foci throughout the tumor. Then, too, there are necrotic foci in the hemorrhagic areas.

The optic disc is completely surrounded by the tumor and the carcinoma cells come right up to the retinal nerve fibers with the full thickness of the tumor. In some of the sections, small

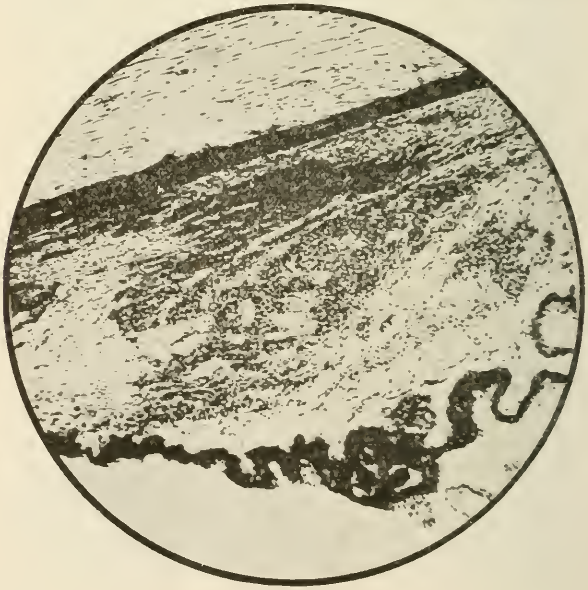


Figure 5.

Carcinoma in ciliary body—extension from Chorioid—Slide of Leber's (No. 63).

nests of tumors cells are found invading and crowding aside the retinal elements. Again, a large clump of carcinoma cell invades the subretinal space at the angle formed by the detached retina and chorioid (Fig. 2).

In the optic nerve there are many islands of tumor cell invasion for a distance of 2 to 8 mm. back of the scleral ring. These islands have replaced actual optic nerve fibrillae (Fig. 4).

In the sclera all along the fibers, next the tumor, there are many single lines of tumor cells that have broken through into the interlamellar lymph spaces.

At the epibulbar angle, on the temporal side, formed by the sclera and the optic nerve, there is a large triangular mass of tissue greatly infiltrated by the carcinoma cells (see Fig. 1). Here are cross-sections of several nerves—the posterior ciliary. The nerve elements are greatly hypertrophied and the tumor cells are not only in the perineural lymph spaces, but also in the nerve fiber bundles displacing the fibrillae (Fig. 4). In some of the slides are shown longitudinal sections of a long posterior ciliary nerve following its usual course forward in the sclera with its perineural lymph space filled with carcinoma cells (see Fig. 3).

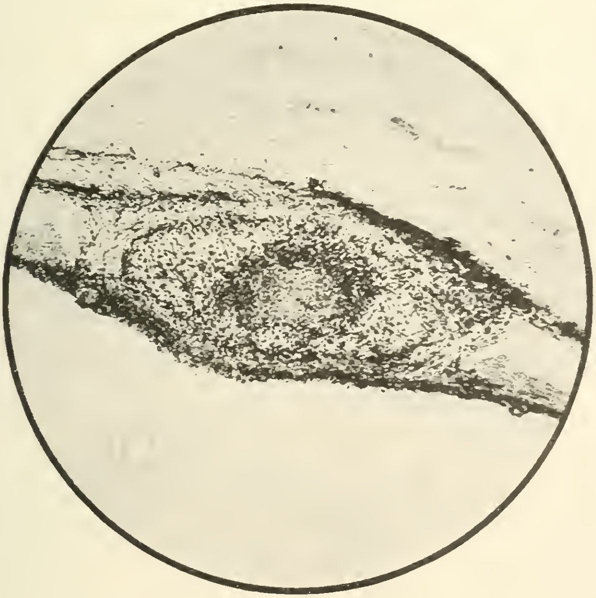


Figure 6.

A single carcinoma nodule in Chorioid—Necrotic mass in center—Slide from Wintersteiner's Laboratory.

Some vessels in this area are in their normal condition; others are full of tumor cells, and in some the cells have broken through the vessel walls. As this triangular mass goes forward, back of the sclera the carcinoma cells infiltrate the tissues in a typic scirrhus manner.

In the carcinomatous node removed from the scapular region the carcinoma cells infiltrate the lymph spaces .

In the secondary nodules from the axilla there are two lymph nodes partially invaded by the tumor cells as well as infiltration of the surrounding tissues.

NOTE.—We have had the pleasure of receiving histories of cases heretofore never published from S. Ginsberg, of Berlin; Theo. Leber, of Heidelberg, and S. T. Y. Sutphen, of Newark, N. J.; also the pleasure of studying sections of cases from Leber, of Berlin, and Wintersteiner, of Vienna. No history of this last case.

## CONCLUSIONS.

The salient conclusions to be drawn from the study of these 64 cases of metastatic chorioidal carcinoma can be tabulated as follows:

1. It does not occur before the age of puberty, nor directly thereafter, but usually between 30 and 60.
2. The invariable presence of a primary carcinoma in some other organ.
3. The great tendency for bilaterality.
4. Exceedingly rapid loss of vision.
5. The uniformity in the lodgment of the embolus in the ciliary arteries.
6. The uniformity in its character of growth.
7. The short duration of life after its appearance in the eye.
8. The rapidity of its growth along paths of least resistance.
9. The scarcity of its perforating the globe.
10. The rarity of epibulbar tumors.
11. The practical immunity of the papilla for its first appearance.
12. The extensive detachment of the retina.
13. The relative large percentage of minus tension.
14. The great tendency of having the three types of carcinoma represented in the same individual tumor—scirrhus, medullary and adenomatous.
15. The proneness of directly involving the blood vessels.

16. The rarity of the tumor cells invading the retina and disc, either by extension or tertiary metastasis.

17. The seeming regularity with which the tumor encircles the disc.

18. The numerous areas of necrosis and hemorrhages.

19. The characteristics in general being directly opposite to those of sarcoma.

# INDUSTRIAL EYE INJURIES

By Wilson Johnston, M. D., Spokane, Wash.

The industries tributary to a city determine to a great extent the character of the injuries seen by the physicians residing there. The chief referred to in this paper come from a territory whose chief industries are agriculture, lumbering and mining. They may be divided into four classes:

I. Those occurring as the result of handling high explosives in mining and railroad construction.

II. Those occurring from the bursting of locomotive oil and water gauges.

III. Those occurring in mills, foundries, machine shops and the building trades.

IV. Those occurring in the agricultural pursuits.

Class I. In mining and railroad construction, high explosives or substances which cannot, like gunpowder, be exploded by simple ignition, but which require an exploder in producing their complete detonation, are almost universally used. Deteriorated powder, poor fuses or improper loading, results in premature blasts and mis-fires. Where the initial detonation is not strong enough to go through the entire charge, only a portion of it is exploded, and the balance is either left in the hole or scattered about the workings in the debris. The majority of accidents occur from drilling into these "missed holes," or from striking a piece of powder with a pick or shovel in removing the debris. A small percentage of accidents are due to the exploding of the copper detonators or caps. The force producing injuries of this class is so great that extensive laceration and destruction of the ocular structures by contusion or perforation is the rule. Severe intra-ocular hemorrhage with injury of the retina and chorioid may occur where there is no penetrating wound of the external coats. In may cases, the cornea, while not perforated, is peppered with fine particles to such an extent that the vision is partially or completely lost on account of scar formation. Of the injuries resulting from 35 blast accidents seen in our office in the last two years, 20 were of both eyes. Of these, five resulted in complete blindness. In five others, one eye was lost, and there was a traumatic cataract of the other. Four of these cataracts were successfully needled and one remains unoperated. In five cases it was necessary to enucleate one eye. The remaining five cases were injuries to the cornea of minor degree.

Of the fifteen in which only one eye was injured, enucleation was necessary in six. In four, the iris was prolapsed and the lens cataractous. Five were injuries of the cornea, two of which resulted in large leucomas.

Injuries of class II occur among locomotive engineers, firemen and wipers. The vibration of the engine subjects that portion of the glass of water and oil gauges which is inserted into the metal caps or holders to constant friction. This causes an inequality in the thickness of the glass and renders it unable to stand the required pressure of 200 pounds to the square inch. In water gauges, the friction of the water alone is sufficient to wear little seams in the glass and render it unsafe. This is well demonstrated in the specimens exhibited, one of which was in service seven days and the other ten days. While medical literature, as noted by Conkey (Ophthalmic Record, May, 1905), contains little pertaining to injuries of this class, I cannot believe they are uncommon.

Of 297 eye injuries noted on our records as occurring to railroad employes, 19 were of this class. In no case were both eyes injured. Enucleation was necessary but once. In two cases there was traumatic cataract. In two, wounds of the cornea and prolapse of the iris. In three cases there were central wounds of the cornea which resulted in impaired vision. In four, the cornea was wounded near its periphery and vision was unaffected. In four cases the conjunctiva and Tenons capsule was wounded extensively enough to require several sutures. Two were cases of simple contusion with subconjunctival hemorrhage.

Class III. The greatest number of injuries are in this class. The majority are wounds of the cornea by particles of steel, emery, sand, etc. Severe injuries are caused by pieces of wood or iron which have been hurled from rapidly revolving machinery, such as circular saws and lathes. A large proportion of penetrating wounds of the globes from iron and steel, occur among men employed in mills, foundries and machine shops. Burns from lime are by no means uncommon. In the past six months, three cases of extensive injury of the cornea have been seen which were caused by masses of cement that fell from buildings under construction.

Class IV. Injuries of this class differ from those of the preceding classes in that the majority are produced by vegetable substances, as straw, beards of wheat, etc., and a greater percentage are infected.

With good artificial illumination, a lens or a loupe, the diagnosis of non-penetrating injuries of the conjunctiva and cornea is a simple matter. The same is true of the severe injuries of the globe where there is a lacerated wound, loss of perception of light, edema of the conjunctiva and lids. When the injury is not severe and the foreign body has caused a wound of the cornea or sclora, the physician must determine whether or not the object is within the globe. If the object is small, and it is in the anterior structures of the eyeball, it may be seen with the aid of the ophthalmoscope. When it is in the vitreous and has injured the internal structures to any extent. the media are clouded and recourse must be had to the electromagnet or the Roentgen rays. Opinions differ as to the wisdom of using the magnet for diagnostic purposes. We use it at the wound of entrance in all recent cases where the penetrating body is supposed to be steel. Failure to elicit pain must not be regarded as positive evidence that there is no steel in the globe. The most positive means of diagnosis is the Roentgen rays. With the aid of localizers, the radiograph shows not only the foreign body but its size and position in relation to the eyeball. In all doubtful cases a radiograph should be made.

In penetrating wounds of the eyeball the prognosis depends on the substance producing the injury. In Classes I and II the foreign body is usually copper, stone or glass. The removal of these non-magnetic bodies requires the use of forceps and. unless located in the anterior portion of the globe, is attended with difficulty and small chance of success. A greater percentage of eyes are lost than in Class III, where the penetrating injuries are usually due to steel or iron. In the non-penetrating wounds of Class III and IV, impairment of vision and loss of the eye is due to infection. Injuries of both eyes in which there is either temporary or permanent loss of vision may destroy the reason. Five of the twenty cases developed mental symptoms. In two patients acute mania occurred, which was so violent that it was necessary to commit them to the State Hospital for the Insane. One of them died, and the other gradually improved as the traumatic cataract became absorbed, but complete recovery only took place after needling of the capsule and the restoration of fair vision. In another case the patient became highly nervous, wakeful, irritable and unreasonably suspicious of his best friends. In the remaining two there was extreme melancholia with a desire for death. They refused medicine, food, drink and accused the doctors and attendants of trying to poison them. Improvement of the mental condition occurred as soon as a little vision was restored.

Considering these accidents from an economic standpoint, we find that those of Class I not only destroy the earning capacity of the individual, but also throw him on the community for support. Accidents of Class II. affect men whose occupation demands a high visual capacity—at least fifty per cent. By rendering the engineer incapable of performing his duties, these accidents, at the time of their occurrance endanger also many lives and much valuable property. Injuries of Classes III and IV, as a rule, affect the earning capacity but little. The artisan or farmer soon learns to accommodate himself to the loss of an eye and is able to accomplish the same work as before.

Injuries affecting one-eyed persons are regarded as rare by Magnus and Würdemann. Two cases have occurred in our practice in the past year. One of the patients lost an eye in childhood and a few months ago received an injury from a piece of steel which reduced his vision to 4-cc. The other man, as a result of a blast, had a traumatic cataract and prolapse of the iris of the left eye. Six weeks later he was again the victim of a blast accident, and the eyes were injured so that he is now hopelessly blind. The majority of these injuries are preventable, and I would advocate:

1. Government inspection of the manufacture of all explosives.
2. Licensing of "powder men."
3. Protection of water and oil gauges by wire or plate glass screens.
4. The placing of guards on all emery wheels, lathes, etc.
5. Education of the laity as to the seriousness of even slight injuries when infected.

In all eye injuries, the object should be to prevent infection.

Too much stress cannot be placed upon the importance of the thorough cleansing of the field at the first dressing. With a clean field, the treatment will depend on the indications. Where the eye is lost, enucleation is the only operation considered, the preference being for the suture operation, after the method of Priestly Smith. When a foreign body has been localized with the aid of a radiograph its extraction should be attempted through an incision of the sclera with the magnet or forceps. If seen soon after injury and the unwounded iris has prolapsed through a wound of the cornea which does not extend to or into the ciliary region, it should be replaced, a few drops of eserine solution instilled and the eye bandaged.

If the iris is wounded, or the corneal injury extends into the ciliary region, the prolapsed portion should be amputated. When seen forty-eight to fifty hours after injury and there is no evidence of infection, open the wound, relieve the incarcerated portion and amputate. If infection has taken place, cauterize with the actual cautery, instill atropine solution and use hot water applications. In the removal of foreign bodies from the cornea, have perfect illumination and use a sharp, fine-pointed instrument.

In conclusion, I would urge the members of this Society to use every means for the enactment of laws which will regulate our industries and tend to safeguard the lives of our workmen,

# A CASE OF TUBERCULAR IRIDO-CYCLITIS WITH ORGANIZED EXUDATE IN THE ANTERIOR CHAMBER

By J. W. Stirling, M. D., Etc., Montreal, Professor of McGill University

Pathological Report by F. T. Tooke, M. D., Assistant Ophthalmologist, Royal Victoria Hospital, Montreal

The tuberculous diseases of the iris and ciliary body are comparatively rare. Hirschberg reported only 12 in 60,000 cases of eye disease, Terson 2 in 30,000, but doubtless as the knowledge of the symptoms peculiar to tuberculous eye lesions advances the percentage will markedly increase.

But the diagnosis being made, there still remains the great reproach of our inability to effect a cure; only about 22 per cent. of the patients suffering from tuberculous irido-cyclitis escape with any vision at all, and what vision there is, is exceedingly limited.

During the past year, two cases of tubercular irido-cyclitis came under my observation, one of which offered some points of considerable interest. The first patient was Mrs. G., aged 38, a weaver by trade, who came to the out-patient department of the Royal Victoria Hospital on February 26, 1906. She was an active woman, but rather poorly nourished, and gave a history of inflammation in the right eye which had started six weeks earlier. The only previous ocular trouble she had experienced was a blow on the right eye by a cork fifteen years ago. The eye at that time was inflamed for three months, but recovered completely.

The cornea when I saw her was steamy and semi-opaque, there were areas of varying opacity in its deeper layers, there was a slight hypopyon, the details of the iris were indistinct and there was marked peri-corneal injection. At this time I could get no history of any constitutional disturbance.

Atropin, warm fomentations, etc., were ordered. The patient was most irregular in her attendance at the hospital, mainly, I presume, because she suffered no pain, but as her ocular condition was gradually becoming worse, the hypopion increasing, and the corneal opacity denser, I induced her to enter the hospital as an in-patient on March 20th. At this date there were deposits on Descemet's membrane, the deeper opacities were more numerous, the hypopion was organizing, but there was no pain on pressure of the eye. The tension was —1, the vision, hand movements at three feet.

There was an evening rise of temperature to 99 or 99.2, and a morning fall to 98 or less. The treatment was atropin, warm fomentations, tonics. On April 9th, as the patient's condition was unimproved, in fact, rather worse, the hypopion increasing and the cornea becoming vascular, I proposed to open the anterior chamber and evacuate the contents. This she refused to allow and left the hospital, but on May 9th, a month later, she returned, as her ocular condition was worse. No details of the iris could now be made out and her general condition was poor; the tension — 1, the vision was light perception only.

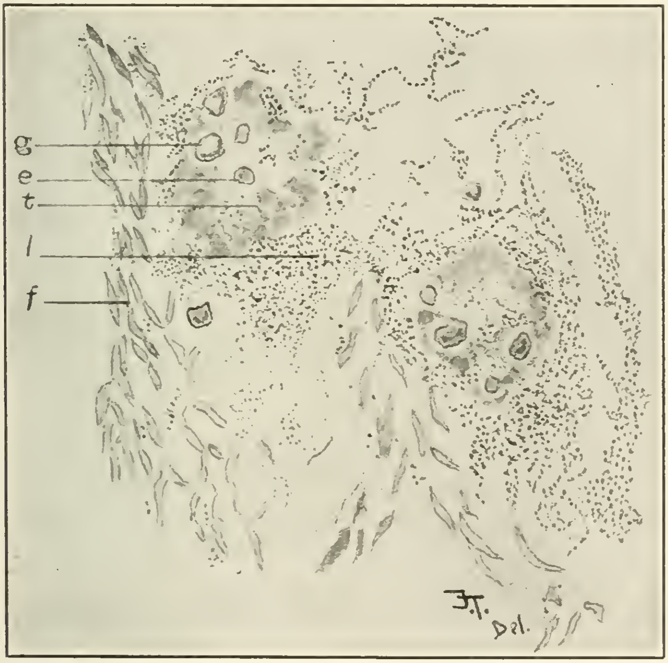
I opened the anterior chamber and removed the hypopion, which came away en masse in my clot forceps. Very rapid and marked improvement both in her ocular and general condition followed. The eye quieted down quickly, and she left the hospital in ten days all injection gone, but the vision was only light perception.

I could not get any history from the patient so far of previous cough, night sweats or other symptoms of tuberculosis, but her family history was bad. Her father died at the age of 45 of tuberculosis. All her father's family died young, except two of her sisters, who died in adult life of lung trouble. On the mother's side the history is good. The patient's sisters are strong, but one brother died of fits. The patient was married 21 years ago, has borne three children, one died in infancy of convulsions, the other two are living, but one is suffering from a chronic enteritis, evidently of a tubercular character.

Dr. Tooke's pathological report on the exudate is unique and interesting.

"The specimen supplied resembled a particle of coagulated pus or slough. It was irregular in shape, of a yellowish white color and of a fairly solid consistence, not disintegrating when immersed in fluid. The particle measured approximately 6 by 2 m. m.; it was fixed in a 5 per cent. formaline solution and subsequently washed very carefully in running water for 24 hours. The specimen was hardened in progressive strengths of alcohol and mounted in paraffine. The sections are about 5 micro m. m. in thickness and the stains employed have been Delafield's haematoxylin and eosin.

"On examination by low power (Reichert Obj. 3), the specimen appears as a ribbon-like band curved, apparently one surface conforming to the curvature of a cornea, while the other assumes that of the iris on the opposite side. This band-like structure consists of two forms of cells; the structural body work of the band is made up of a network of new connective tissue fibres. These fibres are in fairly close apposition to one another at one or two foci, but at numerous points the intercellular spaces are more or less clearly defined. This stroma of connective tissue fibres is most dense anteriorly, bounding that part of the band the curvature which conforms to that of the adjacent cornea. Interspersed through these connective tissue fibres, and more particularly through the intercellular spaces, are quantities of white blood cells, which are distinctly



TUBERCULAR IRIDO-CYCLITIS STIRLING.
Tuberculous exudate from anterior chamber undergoing encapsulation.
8. Giant cell. e. Epithelial cell. t. Tubercle. l. Infiltration of lymphocytes. f. Fibrous tissue cells.

more numerous at certain foci as one examines the section from before backward. On examining by higher power one observes at times that these white blood corpuscles are so dense that they completely occupy the field. These blood corpuscles are mainly of the small mononuclear or lymphocyte group, although some polymorphonuclear as well as occasional large mononuclear blood cells are present.

"At one end of the section directly behind its anterior limiting membrane of connective tissue cells these lymphocytes have formed definite tubercles. These are distinctly round in shape, their periphery being bounded by a dense aggregation of small mononuclear leucocytes. The tubercles consist otherwise of numbers of large epitheliod cells which occupy the whole of the central area of each tubercle. Although actual necrosis can scarcely be said to have occurred, those cells most centrally placed have begun to show signs of degeneration, being distinctly shrunken both in size and contour. Their cytoplasm staining decidedly less distinctly than the other cells more peripherally situated.

"A number of cells in each tubercle as well as a few contained in the intercellular spaces of the surrounding connective tissue formation has not as yet occurred.

"That several sections were carefully examined for the tubercle bacillus in the tissue and that none could not be found is not sufficient evidence that the microorganism was not present, its detection being so frequently a matter of chance and of special technique.

"The histological features of the specimens as well as the clinical course of the disease conformed with our suspicions of tuberculous irido-cyclitis. An especially careful examination was made by high power magnification for the detection of the endothelial cells which cover the anterior surface of the iris as well as for traces of Descemet's membrane which lines the cornea. That none of the former could be found and that the section was quite free from any trace of pignent cells with which the iris stroma is more or less filled during inflammation precludes the supposition that a superficial nodule had sloughed away from the iris and had formed a secondary focus of inflammation in the anterior chamber. A more reasonable supposition would be that of a sub-acute or chronic inflammation of a tuberculous origin where the exudate from the iris and ciliary body consisted largely of lymphocytes carrying the tubercle bacillus with them, rather than of pus cells as found in an acute hypopyon iritis. The action of light penetrating a moderately clear cornea may in a measure have arrested the progress of the disease in the anterior chamber, allowing a definite encapsulation of tubercles and lymphocytes more anteriorly situated to take place."

I did not see the patient again until nearly 10 months had elapsed. At this time desiring to know how she had progressed I sent for her, and when she came to me I found that the left eye was now giving her trouble.

The right one had remained quiescent since I saw her. She told me that in March last it had been inflamed for four months, the intensity of the inflammation varying, at times the eye being quite severely irritable and red, whilst during the intervals it was quiet and the vision fairly good. However, after each attack of inflammation the vision was not as good as before. This eye first became inflamed after an acute attack of rheumatism, during which the joints of her left arm became inflamed, but under ordinary treatment she recovered from her apparently rheumatic symptoms in four weeks.

The left cornea was now stippled, diffusely opaque, dotted with areas of denser opacity in the deeper layers, the denser areas tending to form a ring mid-way between the centre of the cornea and periphery. There was a slight hypopion and the details of the iris could just be made out, the clearest part of the cornea being an area 2 m. m. wide at the periphery, the tension —1, vision, hand movement at four feet, but the eye was not sensitive to touch and there was very slight peri-corneal injection, the evening temperature 99.1, the morning 97 to 98.

Dr. W. F. Hamilton examined the lungs for me for the second time, having done it with negative results during her previous stay in the hospital. He reported now that there were suspicious physical signs over the right apex, the notes slightly short of the normal, a prolonged expiratory murmur with a sharpness or heightened pitch, suggesting chronic infiltration. The treatment was atropin instillation, hot fomentations, exhibition of creosotal and rest in bed.

In the course of a week or two the hypopion disappeared and there was some slight improvement, followed later, however, by a relapse. Her opsonic index was taken and the variation in the index and temperature contra-indicated the injection of tuberlin. On May 9th, without any warning, a small nodule made its appearance at the lower ciliary border of the iris. On May 14th three new small nodules appeared at the nasal border of the iris. On May 16th a fifth one had appeared on the upper border, and on this day we began tuberculin injections, 1-200° of a m. g. of old tuberculin, carefully watching the index and temperature. The injections were continued, improvement gradually setting in and continuing until the present date, six months later. The nodules have completely disappeared and the opacity in the cornea, although more diffuse, is becoming much thinner.

The diagnosis of the nature of the lesion in the right eye was only made after the pathological examination. The opacity of the cornea entirely prevented the discovery of the tuberculous nodules in the iris if they had been present, but it occasionally happens that even where the cornea is clear the tuberculous nodules cannot be seen, possibly on account of their very small size or on account of the layer of exudate on the iris hiding them, or in addition the tubercles may first appear in the ciliary body. Again cases have been reported in which the iritis was of a serous or plastic type, which healed, but on recurring the typical tubercles appeared. We may have an apparently plastic iritis in one eye which comes to a standstill and is later followed by an outbreak of iritis with tubercle formations in the other iris. In this connection it is interesting to note the results of Stook's innoculation of rabbits, setting up a pure plastic chorioiditis.

As regards the tubercle formation, the rapidity of their appearance is well demonstrated in the second or left eye and is very characteristic. Sometimes these tubercles would seem to undergo atrophy, while simultaneously fresh ones are forming in the neighborhood just as we see in tuberculosis of the chorioid.

The result of removing the exudate from the anterior chamber is comparably similar to that obtained by the opening of tuberculous abscess cavities elsewhere, for example, in bone.

As to whether an ididocyclitis is primary or secondary is a vexed question.

It seems hard to imagine how a deeply situated tissue like the iris or ciliary body can be open to a primary infection, although similarly primary bone lesions are reported, yet I cannot but think that in all these cases the primary lesion may have been slight and that the irido-cyclitis is in most cases secondary.

Later on in my own case signs of pulmonary densation of pleuritic thickening were detected, certainly not marked, but sufficient, I think, to point to the primary lesion. It is interesting to note how the initial lung symptoms were in abeyance; the eye symptoms being the prominent ones, and even after a long period of quiescence the recrudescence is characteristic of tubercular irido-cyclitis.

The temperature in my first case and the family history were decidedly suggestive, but at the start there was a complete absence of the symptoms of tuberculosis. In this connection we have to remember how frequently we can have infection of the peri-bronchial glands without their giving rise to the physical signs of tuberculosis, although they may form foci from which metastases can occur.

Some continental authorities hold that the intact mucosa or skin can be penetrated by the tubercle bacillus. One authority stating that rubbing tuberculous sputus into the skin produced no local lesion, but that the adjoining lymph gland underwent caseation. This, however, lacks proof.

In tuberculous iritis the period between the affection of the two eyes is generally little more than a month or two, but in my case you will notice that it covered nineteen months.

As to the treatment, the injection of tuberculin at one time was loudly lauded, but further consideration of the results obtained show that they were most uncertain; in some cases the ocular condition being rendered distinctly worse. This may have been due to the faulty use of the tuberculin, or, no exact attention being paid to the temperature, too large a dose being injected, causing too severe a reaction. The present indications are to start with the minimal dose, causing but the slightest reaction, then very gradually increasing it until a tuberculin immunity is produced. The use of the opsonic index will, I hope, help us in the selection of the suitable stage for injection. With the outbreak in the second eye of my patient, I instituted the opsonic investigation, and it was not until after a prolonged period of observation of the index and temperature that I started the injection of tuberculin 1-2000 m. g. The treatment must, of course, spread over a long period before its results can be judged of, although now (nine months later) there has been great improvement.

# METASTATIC GONORRHOEAL CONJUNCTIVITIS. THE DEMONSTRATION OF THE GONOCOCCUS IN SMEAR AND CULTURE

By Hanford McKee, B. A., M. D., Montreal, Canada.
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(From the Pathological Laboratory of the Montreal General Hospital)

We recognize today two distinct forms of gonorrhoeal infection of the conjunctiva: (1) Gonorrhoeal ophthalmia, due to direct transfer of virulent pus to the conjunctiva; (2) Metastatic gonorrhoeal conjunctivitis, a form which occurs in subjects with systemic gonorrhoea, and which is due to infection carried to the eye by some internal means.

The cause and results of gonorrhoeal ophthalmia in infants or adults is only too well known. Bacteriology has placed our knowledge of its cause on a sound basis, thanks to the work of Neisser and Pirringer.

The second type has been seen for many years, in fact, metastatic was the first of these forms to be recognized, and at one time all cases of gonorrhoeal conjunctivitis were attributed to infection by metastasis. It has a characteristic clinical appearance. Early in the course of a gonorrhoea, or after some months, or during a relapse, the patient suddenly finds both eyes inflamed, with more or less mucopurulent discharge. Shortly after this gonorrhoeal rheumatism makes its appearance.

The inflammation occurs among males, tends to recur, may remain a conjunctivitis or involve other parts of the eye.

While metastatic conjunctivitis has been well understood clinically, its etiology has been the subject of much speculation and discussion. Bacteriological work has been practised to a very limited degree, and in the majority of cases, has consisted in the examination of a prepared smear. Many of these cases, too, were reported before we were acquainted with the pathogenic conjunctival organisms and before conjunctival bacteriology had been brought to its present standard. As was to be expected, the results were largely negative, to such an extent, in fact, that the presence or absence of the gonococcus has been taken as the important point in the differential diagnosis of the metastatic from the direct infection.

If not due to the gonococcus, to what then shall we attribute it? According to Carroll, there are three principal theories. Axenfeld, in discussing van Moll's paper at the congress in Utrecht in 1899, advanced the theory that this form was not due to the gonococcus, but rather to the action of the gonotoxin on the conjunctival tissue.

A second theory is that the inflammation is due to a mixed infection. That the gonococcus, or its toxin, prepares the way for the ordinary pyogenic bacteria, so frequently present in the conjunctiva, to set up an inflammation. The third theory is, that the infection is a true metastasis, that the infection is set up by the gonococcus, carried by the blood vessels to the conjunctiva, as we know it can be carried to different parts of the body. The evidence in favor of this view consists in Lipski, Morax, van Moll, Burchardt, Kurka and Knapp, having found the gonococcus in the conjunctival secretion. Whether differentiation from the other Gram negative diplococci took place or not in these cases, I am unable to say.

Diagnosis of metastatic conjunctivitis depends largely upon clinical evidence.

E. B., a young man aged 19 years, was referred to me by Dr. Vipond, on Monday night, November 2nd, for treatment for gonorrhoeal conjunctivitis. He had been under treatment for some months for gonorrhoea, but in spite of that had spent Thursday night, October 29th, in sexual excess. On Friday his eyes felt "peculiar," and he noticed they were blood-shot. During the following two days the redness increased, and on the next evening he came to consultation. He complained that his eyes were painful, especially the right, though both eyes had become involved simultaneously. There was no swelling of the lids, and but very slight chemosis of the bulbar conjunctiva of the right eye. Intense congestion of both palpebral and bulbar conjunctiva was present, though a ring about the corneosclerotic margin was of normal color and contrasted very markedly with the rest of the conjunctiva. There was a profuse muco-purulent discharge, especially from the right eye, the whole a typical picture of a severe acute catarrhal conjunctivitis of pneumococcus or Koch-Weeks type. After examining the media, fundi and vision, which were normal, slides were examined and media inoculated. His eyes were then washed out with warm boric acid solution. He was given some pulverized boric acid to use and told to return the next day. When he returned the following morning there was no appreciable difference in the conjunctivitis, but he complained that upon arising that morning his left big toe was so swollen and painful he was unable to put his shoe on and had a slipper on his left foot. The next day his foot was so painful that the family physician was called to see him. His diagnosis was gonorrhoeal rheumatism, and he advised his removal to the hospital, where he was admitted to the Eye and Ear ward, November 4th, when the following notes were made:

Patient is a well-nourished, well-developed young man, with sallow complexion. There is at present no urethral discharge. He had had a discharge for three months, but with the onset of the inflammation in his eyes this had stopped. There is no evidence of scar on the penis, no pain on micturation, but a large quantity of pus in the urine. There is marked swelling and redness of the metatarso-phalangeal joint of the great toe of the left foot. Great pain on movement of the foot, and marked tenderness over the joint. The other joints of the body are normal. He has, in both eyes, a severe catarrhal conjunctivitis. Previous history negative. The treatment ordered was irrigation of the conjunctival sac with warm boracic solution, with local applications to the painful joint.

Nov 5th. Eyes show marked improvement. The conjunctival congestion is much less, as also is the discharge. He spent a restless night. The pain in the great toe was very severe. and today he complains of pain in the left ankle and left temporo-maxillary joints.

Nov. 6th. Eyes continue to improve. The great toe of the left foot is not so painful, but both temporo-maxillary joints are involved, and the right knee joint swollen and very painful.

Nov. 7th. Patient had a restless night; temperature 103 F. Bulbar conjunctivae normal; palpebral shows some congestion. but practically normal. Was transferred today to the Medical ward, *i. e.*, four days after beginning treatment, which consisted only of washing the eyes with boracic solution, and eight days after the eye symptoms began, his conjunctivae were in a normal condition.

Nov. 8th. Eyes normal.

Nov. 10th. Eyes normal. Left knee very painful.

Nov. 14th. Right and left knee very painful. Temperature 103. Conjunctivitis present again in the right eye.

Nov. 15th. Eye better.

Nov. 16th. Knees very painful. Urethral discharge today, from which the gonococcus was obtained.

Nov. 19th. Left the hospital.

The patient was seen at his home at intervals up to December 10th. Up to this time his eyes had remained quiet and his rheumatism had been steadily improving. On December 10th, however, his knees and elbows became freshly involved. His eyes became "like balls of fire," and there was again some discharge. The conjunctivitis continued three or four days, but as the rheumatism made no improvement, he was sent again into hospital December 15th. Since that date his eyes have received no treatment, and have remained well. The patient was seen January 3rd and again at a later date in January. His eyes had remained well and his rheumatism had progressed satisfactorily.

The diagnosis of Metastatic Conjunctivitis was made from:

(1) The onset and course of the inflammation.

(2) The absence of clinical signs of exogenous infection.

(3) The coincidence of the conjunctivitis with other systemic gonorrhoeal manifestations.

(4) The bacteriological report.

### BACTERIOLOGY.

When the patient was first seen, one slide after another was prepared and examined, until in one, three Gram negative diplococci were seen either within or upon three leucocytes. Eighteen slides had been carefully prepared and searched through before this result was obtained. Tubes of plain agar, blood serum, haemoglobin and hydrocele were examined. No growth was perceptible. Twenty-four hours later they were examined again. In the tube of haemoglobin agar a profuse growth was seen. The surface was thickly dotted with small raised colonies of whitish color, which upon examination were seen to be the bacillus Xerosis. In the midst of this growth two colonies of different appearance were seen. They were larger, moist looking and colorless. Upon examination these were found to be Gram negative diplococci. These two moist colonies with the surrounding growth necessary, were then transferred to other tubes of haemoglobin agar. From day to day the growth of the Gram negative diplococcus increased, so that at the end of seven days, we had a profuse mixed growth of the Gram negative diplococcus and the bacillus Xerosis. They were then easily obtained in pure culture.

Blood cultures were taken upon two occasions; the first was negative. The second, taken at a time when the systemic infection was marked by severe pain and high temperature, gave us, after 48 hours, tiny points over the haemoglobin agar. These were found upon examination to be Gram negative diplococci, which, however, we were unable to transfer.

The Gram negative diplococcus obtained from the conjunctival secretion was compared with a micrococcus catarrhalis, obtained from the nose, a meningococcus from the cerebro-spinal fluid, and a gonococcus from the urethra. It grew only at the body temperature, did not grow on plain agar, gelatine, blood serum, bouillon or milk. It grew well on haemoglobin agar, with typical appearance; it fermented dextrose. So that, in morphology, cultural features, sugar reaction, this diplococcus was differentiated from the meningococcus, the micrococcus catarrhalis and the saprophytic Gram negative diplococci.

The micrococcus catarrhalis and other Gram negative diplococci are frequently found on the normal and inflamed conjunctiva. This makes differentiation necessary. The Gram negative diplococci found on the conjunctiva in purulent ophthalmia are not always gonococci, or those on the conjunctiva in meningitis cases not always meningococci. Every case of catarrhal conjunctivitis occurring in a patient with systemic gonorrhoea, is not metastatic. Careful bacteriological examination is necessary, and where Gram negative diplococci are found, careful differentiation.

### PATHOLOGY.

A snipping from the palpebral conjunctiva was taken, fixed in Zenker and cut in paraffin. Examination of the tissue showed the following: The epithelium is studded with polymorphonuclear leucocytes. The sub-epithelial tissue shows oedema of the vessels, some perivascular infiltration with lymphoid and plasma cells. The lymphatics are dilated. Immediately beneath the epithelium the vessels are engorged and contain numbers of polymorphonuclear leucocytes, which can be traced in an unbroken path to the epithelium. The presence of this large number of polymorphonuclears in the blood vessels may be of some significance, as it is believed the gonococci in metastasis are carried as emboli to the seat of the inflammation. A search through a series of sections specially stained for micro-organisms gave negative results. Kurka examined tissue from a case and was also unable to find pathogenic organisms. During the last three years I have examined a great many conjunctival sections for organisms. Snippings from cases due to the Morax-Axenfeld diplobacillus, the pneumococcus, bacillus influenzae and other organisms were taken where in the secretion these were found in large numbers. Often a search for them in the tissue proved negative. Under such circumstances it is not surprising that search for the gonococcus in the tissue in metastatic conjunctivitis has, upon these two occasions, given negative results.

It may be asked why, with gonococci in the conjunctival sac, was there such a mild clinical course? Stock has shown organisms causing a metastatic inflammation, produce a much milder form than when introduced in some other way. Again, if gonococci were present in smear and culture, why call the conjunctivitis metastatic? The clinical history and course answer this. The ectogenous type of gonorrhoeal ophthalmia varies considerably in severity. The virulence of the urethral infection may have been attenuated before the eye became inoculated. Mild cases undoubtedly occur, but it is to be remembered that some of these mild infections are not due to the gonococcus, but to the micrococcus catarrhalis and other causes.

The interesting points in this case which gives us a classical picture of a metastatic conjunctivitis in gonorrhoea are as follows: The retropulsion of the old writers was very definite. Although urethral discharge had been present from three to four months, with the onset of the eye symptoms the discharge stopped. Subjective symptoms were present three to four days. The onset of the conjunctivitis was indefinite, and simultaneously in both eyes following sexual excess. The previous history was good; no rheumatism. The clinical picture and the course of the conjunctivitis, almost without treatment, was mild, as compared with the exogeneous type. The tendency of the conjunctivitis was to recur, and to remain a conjunctivitis as it does in 65 per cent of the cases. The rheumatism occurred after the conjunctivitis and ran a typical course. Our interest, however, in this case centres in the bacteriological report. As has been stated, some writers give the absence of the gonococcus in the secretion as an important point in the differential diagnosis, and attribute the metastatic inflammation to a toxin. More likely the gonococci were present, but through faulty methods were not found. The organisms must necessarily be few in number, and a bacteriological report from the examination of one or two slides shows one how easily error may creep in. In this case eighteen slides were examined before any definite result was obtained.

That I was able to cultivate the gonococcus I attribute to having seen the case in its early stage and to having used media upon which the gonococcus would grow as profusely as would the contaminator. That I obtained it in pure culture was due to a frequent transplanting for days, when I really felt the task was hopeless.

Axenfeld, in his book of last year, says: "Morax in his exact bacteriological research stated that scattered gonococci may be found in such cases. Parinaud made the same observation, and their results were confirmed by van Moll. We must not, therefore, conclude from a negative examination for gonococci that the inflammation is due to a pure toxin metastasis, and not metastases of the organisms themselves, though the former cannot be definitely excluded. Certain proof, however, is not yet available."

We believe that the present case makes proof available, that metastatic conjunctivitis is not due to a mixed infection, is not caused alone by the gonotoxin, but that it is a true metastasis of the gonococcus.

# CLINICAL AND PATHOLOGICAL STUDY OF A CASE OF TRANSFERRED OPHTHALMITIS.

By Charles A. Oliver, A. M., M. D., of Philadelphia, Pennsylvania, U. S. A.

On the 25th of November, 1907, while I was absent from the city on a prolonged vacation, a thirty-seven year old machinist was admitted to my service in the Wills' Hospital in Philadelphia. The man gave the history of having been struck in the right eye with a piece of steel half an hour previously. At the time of admission, it was found that there was a small jagged wound situated in the inferior temporal quadrant of the eyeball, through which some blood and vitreous humor were oozing. Vision was reduced to light perception throughout a large and well shaped field. The fellow eye was normal in every respect.

The parts were immediately cleansed, atropine was instilled, and the patient was placed in bed by the Resident Surgeon, Dr. J. Milton Gho, without any complication whatever, successfully removed a foreign body (a minute piece of steel) from the interior of the organ, through the original wound of entrance, by the hand magnet of Parker. A compress bandage was applied and treatment was continued.

One week later, the external wound was healed. The intraocular fluids, however, were so hazy that it was impossible to obtain any more than a faint reddish reflex from the fundus. The field of vision remained as before. Careful study of the left eye showed that the retina to the nasal side of the optic nerve was slightly hazy. Vision with this eye was apparently normal as regards both acutity and field.

In three weeks' time, the injured eye was practically well, and the fellow eye seemed normal in every respect and functioned properly. The patient was placed in the out-door service of the hospital, was ordered to use a cleansing eye wash of a saturated solution of boracic acid, and was told to instil two drops of a two-grain strength neutral solution of sulphate of atropine into the conjunctival cul-de-sac twice daily. He was also ordered to protect the eyes and not to work. In addition, he was given an explanatory letter, containing a request for periodic study and care, to his previous attending physician, and was told to return at fixed intervals.

In spite of this bettered method of treatment, improved condition, and appropriate precaution, he was not heard of for a period of two months, when he returned, complaining of pain in the previously injured right eye, this having appeared without assignable cause.

The organ was extremely tender to touch. There was intense ciliary injection, with marked hyperemia. The lens was cataractous, and the rest of the media were so hazy that it was impossible to obtain any more than the faintest red reflex from the fundus.

The left eye was irritable; vision was slightly lowered; accommodation was disturbed; the media were somewhat hazy, and the fundus was rather indistinct. There was not any injection and the eyeball was not tender.

The patient was immediately brought into the hospital, local palliatives were ordered while preparations were being made for removal of the offending right eyeball, which was done under general anesthesia at once by my official assistant, Dr. Charles J. Jones of this city, giving instant relief to the gross symptoms, and allowing the fellow eye, under appropriate treatment, to rapidly return to its original normal condition and proper functioning.

The specimen was given to Dr. Harold G. Goldberg, the Pathologist and Curator to the hospital, who has kindly given me the following report of his findings:

"Macroscropically, the corneal layers are all intact. There is connective tissue proliferation in the posterior layers of the stubstantia propria. The epithelium of the membrane is degenerated and covered by a granular exudate. The angles are free. There is shrunken granular exudate in the anterior chamber. The iris and the ciliary bodies are atrophic, and infiltrated with polymorphonuclear leucocytes. The anterior surface of the iris is covered with an exudate which is pigment and stained. The lens is cataractous and shrunken, and its capsule is detached. The ciliary bodies are elongated towards the centre, by traction. The retina is pathologically detached and folded, with thickening of the nerve fibre layer.

"Posterior to the lens there is a mass of granular exudate which contains large pigment granules and proliferated pigment connective tissue cells. Outside of this aggregate, and partially enclosing it, there is a deep layer of connective tissue cells, with large mononuclear leucocytes and epitheliodal cells. (This is probably the result of a forward contraction of the vitreous humor.) The chorioid is quite atrophic. The optic nerve is atrophic with an elongation of the papilla and a marked constriction at the lamina cribrosa.

"Microscopically, the cornea is practically converted into a layer of papillary epithelium. There is complete organization of the vitreous contents containing pigment masses, spindle connective tissue cells, new blood vessels, elastic tissue and calcareous material. Running at random through this mass are pale fasiculi of fibrous tissue. There is marked atrophy cf the optic nerve."

### *Remarks*

Clinically, the case is of interest for several reasons: The immediate removal of the foreign body; the primary non-involvement of the ciliary region in the accident; the very early recognition of the first appearance of the transfer of the disease-process; the rapid disappearance of the transferred condition by the employment of appropriate medical therapy; the constantly sustained continuance of therapeutic measures to the very time of enucleation of the offending organ; the one coarse exacerbation which so happily proved to be the warning before the secondarily affected eye had passed the danger line; the immediate cessation of all of the coarse signs and symptoms after the enucleation; the quick and happy recovery from the slight, though fully recognized secondary condition by appropriate treatment, after the primarily affected eye had been removed; and the proof of the lesson, which I have long taught, that it is always best to remove an offending eyeball the moment that its good fellow is involved to the slightest degree.

Pathologically, the study is of value in showing the wide devastation in the anterior segment of the eyeball, the rapid disintegrative processes throughout the deeper chambers of the organ, and the atrophic condition of the optic nerve.

# NODULAR OPACITIES OF THE CORNEA: REPORT OF A CASE.

W. Zentmayer, M. D., Philadelphia.

In 1890 Groenouw described a variety of sub-epithelial degenerations to which he gave the name "Nodular opacities of the cornea." The description given at that time was modified somewhat in the report of the same case ten years later, which was then as follows: The centre of the cornea is occupied by numerous gray irregularly round opacities with small indentations and projections and which may be compared in appearance to small crumbs of dried bread. They are both discrete and confluent arranged, in groups and lines, and on an average of the size of a poppy seed. Between them lie dust-like opacities, forming fine gray lines. They lie in different layers of the cornea down to the membrane of Descemet, but principally just beneath the epithelium which is thereby elevated. The cornea is otherwise clear.

A composite picture of the disease made from cases subsequently reported by other observers and as given by Swanzy would be as follows: A number of small opaque patches of all shapes occupying the most central portion of the cornea while between and sometimes reaching out to the periphery, but oftener leaving a clear margin, are innumerable very fine dots. The patches are grayish and beneath the epithelium, which is at first not altered. Later the patches become elevated. Commonly there is no irritation. The disease is intractable and in the course of time the opacities become denser, the anterior ciliary vessels become distended and vision sinks greatly. There may be slight pain with lacrimation and swelling of the lids. It occurs more frequently in young adult males, and often attacks one or more members of a family and occurs in one or more generations. The disease is extremely rare. Fuchs had not observed a case previous to 1889. The only similar case I have found recorded in American literature is that of Veasey, who classed his with that of Fehr's "Family macular degeneration of the cornea," a supposed intermediate form between "nodular" and "lattice-like" opacities of the cornea.

Groenouw's explanation of the different lesions is that the large opacities are due to different sized deposits in the cornea; that the gray streaks which are here and there observed are due to the formation of lines by overlying opacities, and that the fine opacities are very likely enlarged corneal bodies. He considers the nodes to be due to the deposition of a foreign substance, probably hyalin. This is the generally accepted view, but Wehrli, having found in his case chronic interlamelary inflammation, proliferation of the fixed corneal cells arranged into epithelioid bands and a caseous-like degeneration, with positive general reaction and probable local reaction to tuberculin, considers this a tubercular affection.

In a histological study of a removed node recently made by Videky and Goldzieher, the findings were analagous to those of Fuchs' proliferation of the fixed corneal corpuscles, swelling of the stroma bundles with a beginning hyalin degeneration, subepithelial spaces filled with coagulated fibrin. A difference was the presence of a vesicular elevation of the epithelium. They say, however, that the important point of agreement is that we have to do with a degeneration and not an inflammation. A point also emphasized by Haab. Fuchs concludes from the different nature of the pathological findings in Groenouw's and Chevellereaux's cases from those in his own, that etiologically and materially different diseases may appear under similar clinical pictures.

A perusal of the published cases has convinced Videky and Goldzieher that this type of corneal degeneration appears under sufficient variation to warrant the arrangement of these forms into the following groups:

1. The forms described by Groenouw and Fuchs where distinct nodules are found in the anterior layers of the cornea beneath the intact epithelium and in which the remaining cornea also is not completely clear, but is clouded by dust-like opacities.
2. Identical with the first group, except with the important difference that the corneal tissue between the nodules is entirely clear and transparent.
3. The grill forms which differ from the other groups in that a fine net of elevated lines is present in the cornea.
4. The ring form of Fleischer. Here, however, there is no important distinction from the other groups, except in the arrangement of the nodes which was probably accidental.

In Hancock's case this same tendency to ring arrangement of the opacities was noted. The whole involved area, which had a creamy-white appearance, tended to be drawn out in the fissural space. In my own case, the same arrangement and location was noted.

Elschnig in Axenfeld's text book says that the disease is always a family one, but this statement does not seem to be borne out by the literature, as Wehrli states that Fleischer's report on 34 patients affected with this disease confirms the sometimes family character of this affection.

According to Groenouw, a differential diagnosis is to be made between punctate superficial keratitis of Fuchs, keratitis maculosa of v. Reuss and Keratitis mummularis of Stellwag and this condition.

The points of similarity between the keratitis of Fuchs and nodular opacities are the location and distribution and the association of large sharply defined opacities and dust-like opacities. The inflammatory symptoms and the evanescence of the lesion are points of difference.

In macular keratitis there is a large disc surrounded by a well defined clear areola. It affects principally the periphery, but at times also the centre.

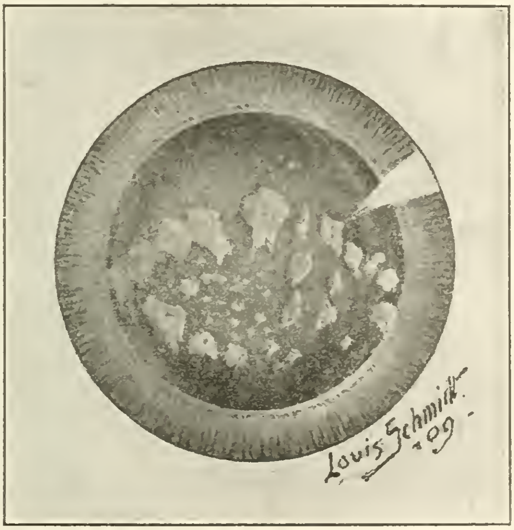
In mummular keratitis there are relatively large foci of saturated yellowish-white color, occupying usually the periphery of the superficial layers but may lie deeper. The prognosis is comparatively good.

My own case is as follows: M. K., age 24 years, single, was admitted to Wills Hospital January 21, 1909. At 4 years of age she had convulsions lasting one week. During childhood she had measles, pertusis and mumps. She has had irregular menstruation, backache and poor general health since her second menstruation and leucorrhea since 14 years of age. She has had no headache. Indigestion she frequently suffers from. V. of O. D., 5/xxv; O. S. 5/cc.

The eye trouble began at 14 years of age with photophobia, lacrymation and slight redness, with failing distant and near vision. She was fitted with glasses at 19, but they did not improve her vision.

Examination of the lungs shows a slightly high pitched note over the entire chest and prolonged expiration. There is a loud systolic murmur at the base of the heart, but the organ is not enlarged. Pulse is rapid, but regular. On January 21 she was given tuberculin (old) 1-500 m. g., with no reaction. On January 27, 1-250 was given, and there was no reaction.

On January 30, 1-2 m. g. was given, followed by prompt reaction, the temperature rising to 102 degrees. This was accompanied by a slight pharyngitis, which did not seem to be of sufficient severity to account for the rise. There has been no local eye reaction. February 12, ½ m. g. was given, and temperature rose to 101 degrees within 48 hours. On February 16 she developed a pleurisy.



Nodular opacities of cornea, showing the corneal lesions in L. E. opacities of the cornea. Zentmayer.

In both corneae there are numerous grayish dense opacities easily visible to the naked eye, which on examination by oblique illumination are seen to present a great variety of form—rounded, triangular and principally irregular; they vary in size from about .5 to 1.5 mm. They are grouped in a somewhat oval area, the upper border of which is a little above the centre of the cornea and the lower on a line with the margin of the lower lid, the whole being lengthened out in the fissural space. There is a tendency for the opacities to arrange themselves into curved lines, and in the left eye they form a distinct whorle. The entire cornea, except the extreme margin is hazed through the presence of dust-like opacities. The larger opacities are in the superficial layers of the cornea, mostly just beneath the epithelium which is elevated, thereby giving to the surface of the cornea an irregular but unbroken surface. The fine opacities occupy deeper layers. The eye is free from congestion and there are no signs of present or past inflammation of the uveal tract. The sensibility of the cornea is diminished and seemingly more so over the position of the larger deposits. The palpebral fissures are narrow.

The patient was discharged from the hospital after a stay of two months, without any appreciable change having occurred.

One of the nodes was removed by disciding with a broad needle, entering as deeply into the corneal tissue as was safe. The palpebral fissures are narrow.

The report of the pathologist follows:

### PATHOLOGICAL REPORT, BY DR. HAROLD G. GOLDBERG.

The layer of epithelial cells has been reduced to two or three cell layers, although the specimen being folded upon itself, the folded end appears to be much thicker. This folding, which has been caused by the hardening fluids produces three epithelial surfaces: the sides thinned, the end thick. These cells are not healthy, but show a general cloudiness and loss of chromatin. The cells in the thin layers are elongated squamous, while in the thick layer they vary in shape, most of them being cuboidal. This arrangement is constant throughout the sections. There are apparently no hyaline changes in the epithelium, although the degeneration already spoken of may be going on to that condition. It is likely that the specimen examined represented a change less advanced than might have been found in some other part of the cornea; moreover, whether the deposit was nodular or not could not be determined histologically because of its small size. Considering the clinical appearance, however, it might be well to describe the portion of degenerated substantia propria as a nodule of hyaline matter, as certainly a later stage in the process would isolate the mass into a distinct nodule, the surrounding structures preserving a more or less healthy condition. The changes in the parenchyma are constant throughout the specimen; there is a general loss of chromatin, the mass presenting the characteristics of hyaline, staining, as far as we are able to differentiate, only a faint trace of nuclear stain remaining in some of the fixed cells. Throughout there is a general indistinctness of individual elements and cloudiness of the whole, the lines of demarkation between the fibres being in some cases entirely lost. The cells are granular, their nuclei destroyed, while the resulting detritus contributes to the ultimate homogeneity or hyaline appearance.

The nodule, then, is composed of layers of fibres in a more or less advanced stage of hyaline change; in some places quite homogeneous, in others (the minority), lines of demarkation can be made out. This represents the gradual melting of the fibres, which is apparently a regressive metamorphosis. On one surface of the section Bowman's membrane is marked and has been separated into fibres much more distinct than the underlying fibres of the parenchyma; on the other side of the section the membrane melts into the substance, becoming a part of it where it turns to fold upon itself. There are no cells between Bowman's membrane and the substantia propria that have been described by other writers, the continuity being quite complete on both surfaces without any intervening space. The hyaline matter may be described as lamellar in character in contradistinction to fibrillar and lancellate, and this forms only because the type of tissue undergoing the change is of this structure. The other forms can, I believe, only be applied to cell degeneration, where there is no definite structure. For the reasons given, the lamellae are not separated by fissures and the cells present are a part of the fixed elements. Inflammatory phenomena are entirely wanting, nor is there any blood vessel formation. The change appears to be a slow degenerative process resulting in complete confluence of all fixed elements, including the products of cell destruction, all of which may, I believe, assume a variety of appearances before the final stage of complete hyaline change.

# EYE CHANGES IN CHRONIC LEAD POISONING WITH REPORT OF A CASE.

E. W. Alexander, B. S. M. D., San Francisco.

(Assistant in Ophthalmology, University of California Medical Department)

Reports of cases of lead poisoning with eye complications are not common. Such small numbers as 12 in 1,217 cases of lead poisoning, reported by Tanqueral des Planches, and 3 in 12,000 cases of eye disorders in the Jefferson Hospital and the Philadelphia Polyclinic, and one lead amblyopia in 30,000 eye patients, reported by Uhthoff, lead me to report this case.

Chronic lead poisoning may give rise to a large variety of eye complications, including amblyopia (transient, but often going on to complete amaurosis), central scotomata for form and colors, large scotomata amounting at times to hemianopsias, paralysis of extra-ocular muscles, inactivity of iris (as a rule dependent upon optic neuritis and retinitis) and fundus changes. The ophthalmoscopic examination shows changes in the retinal vessels most frequent; 10 per cent. of cases are negative, 11 per cent. hyperemia of the disc, 30 per cent. papillitis, 8 per cent. choked disc, 12 per cent. neuro-retinitis, 29 per cent. partial or complete post-neuritic atrophy. The syndrome of alcohol-tobacco amblyopia (central scotoma, temporal pallor of the disc, etc.) is relatively uncommon. (Uhthoff.)

Patient Mr. H. A. K., age 43. Married 17 years. Three healthy children, no miscarriage of wife. Occupation, painter for 22 years.

Habits, good. Anemic looking, but well built. Family history, negative. No signs of congenital syphilis.

History: Five years ago, after eight weeks of white lead painting in the cabins of a U. S. transport at San Francisco, the patient was taken sick with the classical symptoms of lead poisoning, including intense abdominal pain and headache, marked constipation, foul breath and taste, general weakness, paralysis of musculo-spiral and peronei nerves, tremor of hands, etc. Amblyopia impaired his vision to such an extent that he could not recognize his wife or relatives, and continued, gradually diminishing, until some time after his convalescence. Patient returned to his occupation thirteen months after the beginning of his illness, and gives a history of not infrequent abdominal colic, alternating diarrhoea and constipation, and loss of several lower molars.

He states that an ophthalmic surgeon prescribed several pairs of glasses for a progressing dimness of vision, and told him that he had an "inflammation of the middle coat of his eye," the cause of which he could not ascertain. Patient has been in the hospital for several months for an open fracture of the fibula and tibia.

Patient has never had any previous trouble with his eyes.

Present complaint, progressive failure of vision, "spots before eyes, occasional redness of conjunctiva and lids, a few scotomata, no metamorphopsia, or history of same, difficulty in distinguishing differences of shades of colors.

Examination: Slight injection of lids and conjunctiva; pupils, anterior charmber and tension normal. Extra-ocular muscles, apparently normal. Javal, negative.

O. D. V. 14-cc w-l. Sph. equals +0.5 cyl. Axis 180 equals 20-cc. Jaeger equals No. 4 at 4 inches.

O. S. V., 8-cc not improved. Jaeger No. 11 at 4 inches.

Media: Lens and aqueous clear. Fluid vitreous with opacities.

Fundus: Optic discs show evidences of a former neuritis, but no appreciable atrophy. Retinal arteries slightly thickened and tortuous.

Marked bilateral chorio-retinal degeneration in the circumference and extending toward the ciliary region, and some small patches in the macula.

Fields: Marked irregular contraction for form and colors, small central scotomata in the mid-field.

Physical examination: Only notable points were a large tender liver, tender iliac fossae, and an occasional soft mitral blowing murmur.

Urine: Small amount of albumen, no casts, acid, no sugar, 1019; not much above normal in amount per 24 hours: test for lead was negative.

Blood: Complicated by surgical conditions. No pigmentary degeneration of erythrocytes (C. Y. White and Wm. Pepper, in September, 1901, of the American Journal of Medical Sciences, say that the granules disappear in cases of chronic lead poisoning as convalescence is established).

Discussion: This case probably has a degeneration of the choriocapillaris, due to endovasculitis obliterans, which is analogous to the degeneration of that layer which occurs in retinitis pigementosa and syphilis. It involves the weakest part of the chorioidal circulation, viz., at the juncture of the posterior and anterior ciliary arteries. That it is not retinitis pigmentosa, is shown by the character of the field, there being no ring scotoma; by the ophthalmoscopic appearance of the degeneration, having no bone corpuscle appearance, but large irregular plaques of degeneration showing the white sclera and irregular heaping of pigment; and by the negative family history. Night-blindness was present to a certain extent—as in all peripheral chorioiditic cases, but complained of only recently. No night blindness in family. Syphilitic degeneration or chorioiditis is generally more disseminated, though occasionally it involves the periphery in a way which makes it very difficult to differentiate from retinitis pigmentosa. Furthermore, we have an absolute denial of primary lesion, or secondary symptoms from an intelligent man, and no miscarriages of his wife, or loss of children. No syphilitic stigmata of any kind.

The vessels of mesoblastic tissue are said to be more frequently affected by lead than those of other tissues, and in this case the retinal vessels did not show changes commensurate with what must have taken place in the chorioid.

J. H. Parsons says that the process in the chorioid is characterized, as in all small vessels, by a proliferation of the endothelium of the intima and new formation of connective tissue, especially elastic tissue (Remar, v. Michel, Hertel, Raehlmann and others). But it is not the regular increase in elastic tissue such as is found in old people, but irregular knobs and plates, which eventually completely obliterate the lumen (endovasculitis obliterus). At a later stage of the process, thrombosis, hyalin degeneration and miliary aneurisms appear.

# COLLAPSE OF THE SCLEROTIC DURING CATARACT EXTRACTION

By Capt. R. P. O'Connor, Med. Corps, U. S. A.,
The Hospital Fort William McKinley, Rizal, P. I.

The short note on "Collapse of the Sclerotic during Cataract Extraction," appearing on page 257 of the January issue, interested me particularly, because it is the first mention of such an occurrence that I have seen, because of the small number of cases listed, and because I have recently operated on a case in a Filipino, about 60 years of age.

Diagnosis: Double senile hypermature cataract. Operation was done upon left eye first. Upon completion of corneal incision an unusually large amount of aqueous escaped and the eye collapsed to such an extent that the insertion of instruments for iridectomy and capsulotomy was very difficult. Capsulotomy was followed by the escape of a considerable amount of milky fluid. Pressure was then applied as usual, but even with the aid of counter pressure above, the lens could not be tilted into the incision but went behind the scleral edge of incision. The wire loop was then used, the lens being easily scooped out without loss of vitreous.

The milky fluid was then irrigated from the anterior chamber with warm normal salt solution, leaving a clear black pupil.

During these procedures the movements of respiration were attended by an alternate inversion and eversion of the cornea, the former involving the entire cornea and to such an extent that its center reached as far below the corneo-scleral level as it normally is above said level.

It is common to have moderate central depression, but this was my first experience with one of this character. The anterior chamber was then filled with the salt solution and the operation completed.

The right eye was then operated upon at the same sitting, exactly the same conditions being found and, of course, requiring the same procedures, which were carried out with equal success.

Healing was as rapid and uneventful as in an ordinary case, both wounds being closed and the eyes having their natural appearance at the first dressing two days after the operation.

Upon discharge from the hospital, two weeks after operation, I lost track of the case, as the lower class of natives do not care much for themselves. However, the pupils were clear black and without a sign of membrane formation.

# REFRACTION FOR MEN WHO SHOOT.

By Jesse N. Reeve, M. D., Washington, D. C.

Since the recent revival of interest in rifle practice in this country every oculist is likely to have patients who will consult him for some defect in their eyes which has been noticed in shooting. Nearly all of these men have had their "eyes tested free" and are using reading glasses for beginning presbyopia. They can see well enough at a distance for ordinary purposes but the extraordinary strain of target shooting is too much for their eyes and it is noticed that they do not shoot with their former accuracy. A busy oculist is apt to prescribe for such cases just as he does for patients who use their eyes for something less trying and the result will not make either himself or the patient very happy. Of course the examination requires no other knowledge of optical principles than does that of any other patient, and there is nothing in these notes that every oculist does not know. I am only calling attention to a few details it is well to keep in mind if the best results are to be obtained. Nothing is harder on the eyes than long range target shooting. The concentrated gaze, constant shifting of the focus, the dust and glare and gases from the powder make a few hours on the range trying on good eyes and if there is any defect it will be brought to the notice of anyone trying to do good work. Considering the paramount importance of the eyes in rifle practice, it would seem the most natural thing for a man to have his eyes put in order before he begins practice,—he does not wait for his rifle to get out of order before going over it,—and that any one who takes such pains in the selection and care of his rifle and examines his ammunition so minutely would exercise some such care concerning something so absolutely indispensable as his vision. But this is not the case at all. A man apparently intelligent in other things, who would be shocked at the idea of taking his rifle to any but a well known specialist in rifles or who would never risk a pup with distemper to any but a competent veterinarian, and to whom the selection of a chiropodist is a matter of moment, will either drop into the 10-cent store and fit his own glasses or go to some jewelry store with a sign "eyes examined free" and consult some youth about his eyes who can not value his own work much, since he charges nothing.

I do not believe there is one man in ten whose shooting cannot be noticeably improved by having the proper correction. This is important enough to the individual and a good deal more important to the management of a team, this very percentage of improvement may be the difference between winning or losing an important match. To have this most indispensable qualification of a good shot brought up to its highest point of usefulness, is certainly not to be overlooked.

There are several items to be considered in examining such patients which I will mention briefly:—Always give the full correction and order the glasses to be used for shooting only. The glasses that give perfect satisfaction for ordinary use will not as a rule do for target practice. Use a cycloplegic always even up to 50 years unless contraindicated. Order glasses for every error no matter how insignificant it may seem; the correction of an error so small as to seem hardly worth while gives at times great relief and if your patient shoots much he will need all you can develop for him in the way of seeing. The muscular apparatus must be put in the best possible condition and steady as well as clear vision obtained;—there seems to be a shaky eye as well as a tremulous hand, often due to a muscular imbalance and in my opinion many of the "unaccountables" generally blamed upon defective ammunition are entirely due to a sudden tremor of the vision, sometimes to a spasm of the ciliary muscle, when under the strain of "holding" at the critical moment of pressing the trigger.

The eyes, the rifle sights and the correction may be considered parts of the same optical instrument and these parts must be adapted to each other. Sometimes a puzzling situation may be cleared up by a slight modification of either the sights or the correction, and at times only a telescopic sight will give satisfaction. If the oculist knows nothing whatever about rifle shooting and expects many marksmen as patients it will pay him to drop in at some gun store and look at the different kinds of sights and their adjustment. Otherwise he will not be able to treat these patients to the best advantage. A rear peep sight should be used by a man with any defect of vision and thus avoid the formation of the pernicious habit of continually looking from target to sight and back, which is apt to happen when the accommodation begins to fail. Using a peep sight his eye will always take the center and the sight can be ignored. The ordinary spheric or sphero cylindric lens is well enough for most patients but they will not do for shooting at all. They will most likely do more harm than good if the lens is at all strong for this simple reason. No one looks through the center of the lens in taking aim. The head is held in such a manner that the line of sight passes through the upper left segment of the lens and the lens has the effect of a prism in proportion to the strength of the lens and the distortion and displacement of the target is bewildering and correct shooting is impossible. A toric lens must be used if possible, but some lenses cannot be made up as torics and these are the very lenses that should be accurately centered.

A method I have used with a great deal of satisfaction where toric lenses cannot be used is to place the correcting lens in the disc of the peep sight and there are several advantages in making the lens a part of the sight that will suggest themselves. The dust and glare of a rifle range necessitates a protective glass of some kind and I find the amber colored the best for that purpose. It has many advantages and I have several times ordered the correcting lenses made of this material. They have always given perfect satisfaction.

The advent of presbyopia is always an interesting time for the one who loves to shoot and if his eyes have never been examined and there is a latent error it may prove an exciting time as well. Many a man has given up his favorite sport when he is only in his early prime on account of some slight error when a visit or two to an oculist would have enabled him to continue rifle practice indefinitely in more comfort then he had ever had. Other things being equal, presbyopia should not affect one's shooting at all and, the other infirmities of age excepted, a man should shoot as well at 75 as at 25—better if practice and experience have any value. If the following items are remembered when a patient in the class mentioned is under examination it is not likely that the doctor will have any trouble in securing a good result.

Examine under a cycloplegic even at 50 or more unless contra indicated. Correct every error no matter how insignificant and always order the full correction. As a rule order a pair of spectacles to be used only when shooting. Remember that the center of the lens will not be used by the patient and that the effect of looking through any other part of a plain spheric lens will have the affect of a prism. Order toric lenses when it is possible to use them. When toric lenses cannot be used, among other methods of arranging the lens so the center must be used, it is a good plan to incorporate the lens with the peep sight and have it permanently fixed on the rifle. For protection try the amber glass and if the eyes are very sensitive have the correction made of this material. See if the rifle sights are such as to give best results with the correction.

# HYPERCHLORHYDRIA AND AMBLYOPIA.

D. J. Maloney, M. D., Waterbury, Conn.

Amblyopias from various causes are not at all uncommon. In few diseases can we find a greater multiplicity of etiological factors, and in fewer conditions can a plan of treatment be laid out with a more positive feeling that the diagnosis is correct.

Amblyopias resulting from organic, symptomatic, toxic and reflex conditions are varied. Indigestion is mentioned by some writers as a cause, but nowhere have I found any specific form of gastric indigestion as the precursor.

The following case came under my observation, August 15, 1908. Mrs. N., age 52 years, has had "stomach indigestion" for the past six years, with short periods of respite. The symptoms as described by the patient are as follows: Heavy, full feeling after meals, followed later by expulsion of much gas from the stomach; sharp, burning pain in left side, frequent vomiting, (no blood) of decomposed acid foods, often that eaten forty-eight hours before. The burning feeling was relieved by taking food. Bowels were also constipated. Six years ago vision began failing for reading and near work, and I prescribed the following: O. D. sph. + 2.00, O. S. sph. + 2.00. The foregoing correction equalled No. 1 Jaeger. At this time distant vision was practically normal, V. O. D.—20/xx, V. O. S. —20/xx. The failure of near vision at this time was simply an expression of presbyopia.

For the past three years, distant vision, has been very hazy and dim at times and relief has been sought by visits to opticians, who changed the lenses and also gave her a distance correction, but there was only temporary improvement. One year ago vision became so dull and indistinct for both distant and near objects, that patient gave up her business as seamstress and almost entirely abandoned reading except headlines in newspapers. During the past summer Mrs. N. again consulted me, some five and one-half years since the previous and first visit and the foregoing history of indigestion and partial blindness was given.

Examination revealed the following: Patient weighed 160 pounds, was fairly well nourished, eye balls dull looking, pupils somewhat dilated, reacting slowly to light and accommodation.

Lungs, heart and kidneys were normal. Stomach was dilated. Ophthalmoscopic examination showed nothing abnormal except a slight wooliness of the papilla. Sclerosis of the retinal arteries and suspected nephritis was the diagnosis of a previous attending physician, but several ophthalmoscopic examinations convinced me that no arterial disease existed. There were no scotomas. From the foregoing symptoms and examination a diagnosis of hyperchlorhydria, dilated stomach, and the usual accompanying chronic gastritis was made. Retinoscopy revealed + .75 error of vision in each eye. On taking the Snellen test, patient read 20|cc. with each eye. At this time she was and had been wearing + .75 for each eye, but on the date of the examination, vision was the same, 20|cc, either with or without the lenses. Near vision for Jaeger's type was very poor, even with her proper correction, + 3.25 sph., No. 4 was very indistinct and could not be read with comfort.

Treatment: No change was made in the lenses now worn, + .75 sph. for distance and + 3.25 sph. for near. An alkaline treatment of Bicarbonate of Soda, Magnesium Carbonate and Strontium Bromide was ordered, one hour before each meal. Dietetic rules were advised and general hygienic principles incorporated with the foregoing. Large draughts of warm water were ordered in the morning on arising and at bed time. Regulation of the bowels by salines, limited nitrogeneous food, and no acid fruits.

Three weeks later patient reported great improvement and with a history of but one attack of vomiting. Vision was gradually improving. She now read 20|lxx with both eyes and Jaeger No. 3 with each eye with the lenses + .75 sph. and + 3.25 sph. General symptoms were much improved. September 26 patient reported stomach still improving and felt brighter and more ambitious than in over a year. Vision now 20|xxx in each eye with + .75 sph. and Jaeger's No. 2, with + 3.25 sph. November 17, Patient reported condition still improving. Vision at this time was normal for both distance and near. Two weeks later another attack of vomiting and burning pain in side, with an accompanying dimness of vision was reported. This was traced to indiscretion in diet ,and attributed to food eaten in an adjoining city at an Autumn Fair. At this time medication was changed to powdered Rhubarb, Bicarbonate of Soda and powdered Ginger, to be taken before meals. Alternating between the above prescriptions the patient has done very well, and has had no more attacks of amblyopia such as she suffered from for over a year.

Hyperchlorhydric conditions, when they assume chronicity, are not only aggravating and extremely painful but often are the antecedents of more serious lesions. A dilated stomach almost invariably results, and once the latter condition is present, atrophied and passive gastric muscles cannot properly functionate, and the result is malsecretion of the glands and normal acids with an end result of misery and perforation. I do not feel that this patient is permanently cured. The immensely dilated stomach can never again regain its normal size and tone. It is probable and quite possible, that there is an ulcer, even though a history of blood vomit is absent, and a surgical operation may eventually be imperative.

An undue amount of acetic acid in the stomach may cause many of the symptoms complained of by this patient, but in such a case a test of the stomach vomitus will differentiate between the two acids.

## CONCLUSIONS.

1. Hyperchlorhydria was primarily the case of the amblyopia.
2. The resultant decomposed foods and gases acting on the vaso motor system and through this affecting the visual center, were the secondary and direct cause.

Assuming these conclusions to be true, and knowing the great prevalence of hyperchlorhydric conditions, why do we not see more cases of amblyopia from such an etiology.

## *Abstracts from Recent Ophthalmic Literature*

### AMBLYOPIA AND BLINDNESS.

Hereditary Blindness and its Prevention.—Loeb, Clarence, St. Louis (*Ann. Ophthal.*, January, 1909).

This is a very elaborate paper, presenting the various forms of blindness and their hereditary associations. The average percentage of affected children in all diseases of the eye taken together is 54.8 per cent. when both parents are affected, and 57.4 pr cent. when only one parent is affected. The percentage of indirect heredity is somewhat higher than that of direct, while that of collateral is the highest of all. The author makes a strong argument in favor of the passage of laws for the prevention of marriage of people who are blind from disease. He even goes farther than this in that he would make this law apply to any family blindness. M. B.

One Language for the Blind.—(*The Outlook*, April 17, 1909).

The pity formerly bestowed on the blind is now turned into a recognition of the necessity of giving them an up-to-date education. The plan of placing the blind child side by side with the normal child in the public schools has worked admirably in Japan, England, Chicago and elsewhere, and is to be adopted in New York. Early attempts at alphabets for the blind are described, and the Braille alphabet designed by a Frenchman, Louis Braille, born in 1809, with method of writing explained. This system was modified by Dr. John Dennison Russ, his system being called New York Point. A counsel of blind men appointed by the British and Foreign Association declared against this system thirty years ago, and the same objections are made against it today. It is more difficult and in some respects defective, having no satisfactory signs for capitals, apostrophes and hyphens. Braille has never been replaced by any other type. Over fourteen Braille magazines are published in Great Britain, including a bi-weekly article in Braille in the Daily Mail. Many Braille books are being printed in Massachusetts, Pennsylvania, Illinois and elsewhere. Text-books of the Board of Education are to be had in Braille, and there are over three thousand pieces of Braille music in the United States, with many more thousands of the identical musical notation to be had in Europe. P. H. F.

BLINDNESS CAUSED BY OPHTHALMIA NEONATORUM.—KELLER, WILLIAM SEBALD, Cincinnati (*The Lancet-Clinic,* February 27, 1909), gives numerous statistics, including those of eight institutions for the blind, which show that 25.51 per cent. of the blindness was due to ophthalmia neonatorum. He also gives a part of the report of the two members of the therapeutic committee appointed by the British Medical Association to investigate the bactericidal powers of the various silver preparations, of which twelve, including silver nitrate, protargol, and largin are reported powerfully bactericidal; nargol, moderately bactericidal, and collargol and argyrol practically without bactericidal action. The percentage of silver in each is given. Among other things, the committee says that the amount of silver which a compound may contain is no criterion of its bactericidal power. Since 25 per cent. of the blindness in the United States is needless, $500,000 or one-quarter of the sum appropriated annually for the support of the fifty blind schools could be saved each year. He gives the statute in Ohio relative to this cause of blindness, which has been buried so deep for fifteen years that few have known of its existence, and makes a plea for united support against all infectious diseases of the eye.

M. D. S.

THE INCURABLE BLIND.—KELLER, WILLIAM SEBALD, Cincinnati (*Lancet-Clinic,* February 13, 1909), mentions many blind persons who excelled along certain lines. He emphasizes that facility is what the blind man has lost, not skill. The Bureau of Census report for 1900, which he gives in full relative to the blind, showed in the United States 64,763 blind, 29,118 of whom had slight perception of light. Nearly all states have institutions for the blind, but not one of them offers a course of study which can compare with those of our modern colleges, therefore, the blind, unless the exceptional one who can afford a tutor and companion, are unable to obtain a higher education. The Perkins institutions and Massachusetts asylum in Boston are the only institutions for the blind having a department for the teaching of higher mathematics, languages, astronomy and natural philosophy. But here, this is more of a side issue than a regular course. He says that in Cincinnati there is accumulated the greatest variety of books for the blind to be found anywhere in the United States. There is also maintained there a school and an industrial home. He mentions three publications for the blind: The *Ziegler Magazine, The Milwaukee Weekly Review,* and the *Christian Record.*

M. D. S.

## ANOMALIES.

Anomalies in the Optic Nerve and Retina of Normal Foetal Eyes. A Contribution to the Glioma Question. —Seefelder, Leipzig (*Graefe's Arch.,* LXIX-II. 3, January 5, 1909.)

The anomalies in question consist in cell complexities in the rudimentary retina in places where under normal conditions they do not exist, a condition well recognized in malformations, but to the author's knowledge not in otherwise normal eyes. In the first instance, in a six months foetus, near the border between the optic nerve and sclera, distant from pigment epithelium, there was an island of pigment epithelium in no way connected with the normal pigment epithelium. In the second, there was found in an eight months foetus a typical retinal rosette between the ganglion cells and the inner granular layer at the border between the optic nerve and retina.

In the third, in a seven months foetus, well marked retinal rosettes were found on both the temporal and nasal sides of the optic nerve entrance near the vitreous. The rosettes were completely separated from the granular layer and were largely surrounded by nerve and glial fibres. Associated with this anomaly, there was a fairly well defined tumor-like cell-growth where the retina goes into the optic nerve. It was connected with both of the granular layers and presented two processes, one of which broke through one of the layers, reaching the vitreous; the other losing itself between the nerve fibres in the direction of the optic nerve.

In the fourth observation, the retina showed in two places in the median portion a slight swelling; one of these was solid, the other, cystic. Lateraly a thickening was to be seen near the ora serrata. Microscopically, the outer granular layer formed an almost complete Mäander figure, but retained its normal structure.

The author believes that these findings justly excite the suspicion that they are the original forms of the glial type; but what aroused these cell complexes from their quiescent state to limitless growth, the anatomical study has not disclosed.

W. Z.

Congenital Aniridia.—Wernicke, Otto, Buenos Aires (*Anales de Oftalmología,* February, 1908.)

Cases of this anomaly are not very frequent, and therefore he publishes the following: I., an Argentinian; parents and brothers healthy; the eyes of the boy, 12 years old, are defective from his birth, according to his mother; the lad is healthy and presents no other anomaly. Photophobia to direct light external parts normal, in both eyes; horizontal nystagmus. The intraocular changes almost equal in both eyes, which attract attention by their dark color, not allowing either the iris or the pupil to be perceived by oblique illumination; cornea transparent, except in an opaque zone, 2 millimeters in width around the limbus; anterior chamber normal; no signs of iris are seen. The crystalline lens, irregularly circular, are diverted upwards ,their upper edge touching the limbus, with a zone of aphakia, 3 millimeters in width, remaining downwards; both lenses show on the periphery opaque grooves and on the posterior cortex massive white spots. Neither the zonule nor the ciliary bodies are perceived. Fundus of the eyes normal. Distant vision reduced to counting fingers; near vision, R. E. Wecker No. 5 to 8 centimeters, L. E. Wecker No. 4 to 6 centimeters.

The author proposes tattooing as a remedy for the photophobia, when the lenses have been successfully extracted, or when the latter are quite transparent.

J. de J. G.

## BACTERIOLOGY.

Demonstration of the Spirochaeta Pallida from a Mucous Patch of the Conjunctiva.—S. H. McKee (*Montreal Medical Journal,* March, 1909; see also *Ophthalmic Record*. February 1909).

The patient was seen in the Montreal Maternity Hospital for a swelling of the lower lid. A history of syphilis was obtained and a scar on the vulva was found. A rash was rapidly disappearing, while her mouth was covered with a mass of mucous sores; glandular enlargement was marked. The patient complained of no ocular discomfort. There was marked congestion of the conjunctiva bulbi, and on drawing the lower lid down the outer quarter of its surface was seen to be of a distinctly different color. The patch was of a definite pale blue color, with well defined margin, and contrasted plainly with the reddened conjunctiva. Slides were prepared from the patch by the Giemsa method, by Dr. R. P. Campbell, and quantities of the spirochaeta pallida were demonstrated. Other slides prepared from the throat showed the spirochaeta pallida and refringens.

The author quotes Stephenson as having found the spirochaeta pallida in the aqueous humor of a woman with iridocyclitis during secondary syphilis, and also in the scrapings from three cases of keratomalacia in syphilitic infants. Babs found this germ in the eyes of three still-born syphilitic fetuses.

The patient was put upon antisyphilitic treatment and made satisfactory progress; no local measure were applied to the conjunctiva, which healed without further annoyance.

BACTERIOLOGICAL DIAGNOSIS OF CONJUNCTIVITIS. ITS FREQUENCY IN MEXICO.—OCAMPA, GREGORIO, Inaugural Thesis of the Faculty of Mexico (*Anales de Oftalmología,* September, 1907).

The author tries to find out whether the bacteriological study of the conjunctival secretion agreed with the clinical diagnosis, and with that object he studies the patients attacked by conjunctivitis, who attend the Out-patient Department of Ophthalmology in the Central Dispensary of the City of Mexico. After indicating the technical course followed and after studying minutely the different germs that produce conjunctivitis, the author presents the results he obtained from 33 cases examined: Sex, 13 men and 20 women. Clinical diagnosis: acute conjunctivitis 23, sub-acute conjunctivitis 3, chronic conjunctivitis 2, and purulent conjunctivitis 5. Bacteriological diagnosis: Koch-Weeks baccillus 8 cases, Morax-Axenfeld 18, gonococcus 7, diphtheria baccillus 1, no microbes 2. The figures found by the clinical diagnosis do not agree with those of the bacteriology of the 23 cases of acute conjunctivitis; in 6 only was found the germ considered as its producer, the Koch-Weeks baccillus, and of these 6, in 1 the diplo-baccillus of Morax was also found. In the remaining 17 cases, 13 contained the Morax Axenfeld diplo-baccillus, 2 none, another case gonococcus and another that of diphtheria(?) It may be that in Mexico the Morax-Axenfeld diplo-baccillus is able to produce conjunctivitis which clinically bear the character of acute; in an epidemic in the Foundling Asylum, after examining 6 cases, 3 gave the Koch-Weeks baccillus and 3 the Morax-Axenfeld.

The cases which gave no microbe had been antiseptically treated before collecting the secretion.

In 5 cases diagnosed as purulent ophthalmia, the gonococcus was found, and in one of them, the Morax diplo-baccillus.

In one case which did not present symptoms of purulent ophthalmitis the pure gonococcus was found.

In the sub-acute conjunctivitis, there also exists a disagreement between the clinical and the bacteriological diagnosis, for the Morax diplo-baccillus was associated with that of Weeks'.

In 2 cases of chronic conjunctivitis, the Morax-Axenfeld was found.

The author then gives the following statistics: From February, 1905, to February, 1907, there came to the Central Dispensary 2,855 eye patients, 835 with conjunctivitis in all its forms, the majority of conjunctivitis being 29.24 per cent. of the total of eye diseases. Conjunctival diseases, among themselves, are in the following proportion: Acute, 74.61 per cent.; purulent conjunctitvits, 13.18 per cent.; chronic, 4.19 per cent.; phlyctenular, 3.35 per cent.; follicular, 1.07 per cent.; trachoma, 0.8 per cent.; diphtheria, 0.3 per cent.

As regards the time of the year when most cases presented themselves, the author has found a marked increase in May and August of one year, with exacerbations in January and October, which the author attributes to the velocity of the winds and the absence of rainfalls. The data which he has collected from the Central Meteorological Observatory tend to approve his findings. J. DE J. G.

EXPERIMENTAL INVESTIGATIONS ON THE BACTERIOLYTIC ACTION OF BILE AND ITS SALTS ON GERMS PATHOGENIC FOR THE EYE, ESPECIALLY PNEUMOCOCCI, AND ON ITS FITNESS IN PNEUMOCOCCUS INFECTION OF THE CORNEA (SERPENT ULCER). —VERDERAME, PH., and WEEKERS, L. *(From the Eye Clinic* *of Prof. Theo. Axenfeld in the University of Freiburg i. Br.-Klinische Monatsblaetter fuer Augenheilkunde,* XLVI., 11. 1908, p. 289).

Neufeld observed a bacteriolytic action of bile on Fraenkel's diplococcus, while other microorganisms were not influenced by it, and Schultze and Levy ascertained the bacteriolytic action of taurocholate of sodium on pneumococci. The authors in their experiments, which are described in detail, found also a specific action of taurocholate of sodium on pneumococci from various ocular affections, while solutions with other microbes, diplobacilli, xerosis bacilli, etc., remained opaque. If, however, exudations and pus, which contained pneumococci, were treated with taurocholate or glycocholate of sodium, no certain bacteriolytic action could be observed. Their action on pneumococci in the living, where they are lodged between the corneal lamellae and are less accessible, will be much less, as was shown in several cases of serpent ulcer. In advanced or serious cases of serpent ulcer, the cholates are not able to stem the progress of the corneal infection and cannot be recommended. G. Z.

ON THE ACTION OF CHOLATES IN GONOCOCCI.—LOEHLIN, WALTER, (*From the Eye Clinic of Prof. P. Roemer in the University of Griefswald. Klinische Monatsblaetter fuer Augenheilkunde* XLVI., 1, 1908, p. 522), observed in 2 cases of gonorrhoic conjunctivitis in new-born children who has intense icterus, an unusually light course of the disease. Surmising an inner connection between this benign and rapid course of gonorrhoic conjunctivitis and the intense icterus, he made experiments on the action of cholates on cultures of gonococci, which he reports. He found a considerable bactericidal action of cholates on gonococci, but so far he had no opportunity to test this therapeutically. As strong solutions, i. e., from 5 to 10 per cent., caused in the eyes of rabbits intense hyperemia, chemosis, profuse secretion and transient opacity of the cornea, he recommends for trial from 1 to 4 per cent. solutions. With regard to the unfavorable results of Verderame and Weekers (reviewed in this No. of Ophthalmology), with cholates in corneal ulcers, L. contends that in gonorrhoic conjunctivitis the conditions are entirely different, as the solutions may much easier act on the gonococci in the secretion and conjunctival epithelium than on the pneumococci within the tissue of the cornea. C. Z.

## CATARACT.

Conditions under which the Striae of Incipient Senile Cataract Appear and Disappear.—Connor, Leartus, Detroit. Mich. (*Ophthalmic Record,* January, 1909). The author believes that senile cataract is a local manifestation of poor nutrition incident to improper dietetics. The striae was caused by shrinking of the lens substance from failure of the capsule cells to form lens fibres adequate to fill the vacancy left by shrinking of those that constantly join the nucleus. The result is an open space filled with lymph, making striae, which after a time undergo changes into dots, granules and general opalescence. Any systemic disease which interferes with nutrition may be responsible for these lenticular changes. Our treatment should be directed toward improving the nutrition of the individual by correcting constipation, intestinal toxemia, methods of exercise and hygiene and correction of circulatory evils, such as increased blood pressure. Locally, the treatment should be accurate correction of errors of refraction, soaking eyes with hot water, the use of dionin and the prohibition of excessive use of eyes for near work. Several cases are reported where the lenticular opacities entirely cleared under this treatment. M. B.

The Importance of the Early Diagnosis of Cataract and the Treatment of this Condition with Resorcin.—Etue, Zwickau (*Wochensch. f. Therap. u. Hyg. d. Aug.,* April 1, 1909), claims to have obtained marked betterment of vision in incipient senile cataract by the local use of a ½ resorcin ointment (vaseline base). The application daily over a period of from three to four weeks is sufficient to bring about appreciable results. He has observed in this time an increase from Jr. 16 to Jr. 9 or from Jr. 7 to Jr. 8. He states that developed cataract cannot be cured by this treatment, but cataract may be arrested in its incipiency, especially where the peripheral opacities have not reached the pupillary space. But even when this has taken place, practical results are secured. An improvement of from 8 to 4 numbers of Jaeger's test type is the rule. If the vision with test lenses is under Jr. 12-14, it is useless to try this treatment. W. Z.

HEREDITARY LAMELLAR CATARACT. — HARMAN, N. BISHOP, London, Report of January meeting of Ophth. Soc. of the United Kingdom (*Brit. Med. Jour.*, February 6, 1909). This paper gave a brief history of four generations of lamellar cataracts. The writer showed the pedigree of a family for five generations, four of which presented a marked inheritance of congenital cataract. Seventeen childships were traced, comprising 63 persons; 8 died in infancy; of the remaining 55 it was known that 19 had congenital cataract. In no case had there been any in-breeding, or marriage with a person similarly affected. The type of cataract was, for the most part, central opacities of varying size; some were minute Y or X or star-shaped, others showed definite lamellar formation. In some cases the cataracts were of long standing, and no evidence could be found that they had progressed beyond the stage at which they were earliest seen. Probably the number of cases of cataract found did not represent the true total, for in one childship of seven members, amongst whom only one case of cataract was admitted, examination of the seven showed that four had lenticular opacities. The inheritance was strictly from those who had cataract. In no case was cataract found in a child where the parents were free from the defect. When a defect had disappeared from a branch of the family it did not tend to reappear. The teeth usually were good, and no other development errors were found. C. H. M.

INDICATIONS FOR THE SUTURE OF THE CORNEA IN CATARACT EXTRACTION.—ALONSO, ANTONIO, San Luis Potosí (*Third Annual Meeting of the Mexican Ophthalmological Society* and *Anales de Oftalmología*, January, 1908).

The sewing of the cornea in a cataract operation ought to be an exceptional proceeding; for although it facilitates cicatrization and avoids hernia of the iris, yet it deforms the cornea and produces opacity thereof.

The author believes that sewing is indicated: 1st, in certain capsulo-lenticular cataracts, with an opaque and thickened capsule, when, after extracting the lens, the thickened capsule remains and exposes the eye to infection from delayed union; a previous suture of the cornea will allow the capsule to be extracted and the lips of the wound to be approximated immediately. 2nd, in trembling subluxated cataracts, with zonular alterations; and 3rd, in cataracts with hypertension, small anterior chamber, iris paretic and pupil dilated. In such cases hernia of the iris is avoided and also escape of the vitreous humor, which is so frequent.

The suture should be fine, aseptic, close to the limbus and without going through the corneo-scleral parenchyma; the threads to be left from 5 to 6 days. J. DE J. G.

EXTRACTION OF CATARACT IN THE CAPSULE.—JAMIESON, R., Belfast (*Trans. Bombay Med. Cong.,* 1909), says that extraction of the lens in the capsule is the ideal method. He is a pupil of Major Smith of Jullundur, "commencing as an absolute beginner at cataract extraction by any method," working under the personal supervision of Smith, he very modestly reports and comments upon 260 cases in which he did the intracapsular operation, in which has had the very remarkable result of 95.8 per cent. of successes. He had vitreous escape in 14 (5.1 per cent.), iritis 4 (1.5 per cent.), poor vision, i. e., below 6/1x, 11 (4.2 per cent.), capsule left behind 8 (3 per cent), suppuration 2, expulsive hemorrhage 1. In 4 of the cases there were fundus conditions, and if these are excluded, there were 97.3 per cent. of successes.

In the 14 cases of vitreous escape, good vision was secured in 9, in 4 of which the escape occurred in attempting to remove with iris forceps remains of capsules which had ruptured. He quotes Smith's experience that expulsive hemorrhage is not the result of vitreous escape. Freedom from iritis is one of the greatest features of the operation. Bursting of the capsule is a serious complication, exposing the eye to risk of iritis and necessity of a needling operation.

Suppuration occurred in 2 eyes, one following escape of vitreous, and the other a normal operation. Remarkable low percentage, as amongst the Punjab peasants 15 per cent. of the eyes are in such a state of chronic conjunctivitis, usually trachoma, that rigorous treatment for weeks or months would not put them in a condition in which a European surgeon would touch them. Immunity to sepsis is due to the small number of instruments entering the eye and to the use of a douche of 1:2000 mercuric chloride to wash out the conjunctival sac immediately before the operation. This occasionally causes striped keratitis, but in only one case has he seen marked opacity.

The percentage of escape of vitreous (5.1 per cent.) is almost as low as by the old method (3.5 per cent.). It has not the evil result of the capsulotomy operation; when it occurs in the latter case, the retained lens matter causes iritis and iridocyclitis, with probably late detachment of the retina from shrinkage of inflammatory exudate. All foreign matter is removed by the intracapsular method; no iritis has followed, except where there was rupture of the capsule.

Poor vision resulted in only 2.7 per cent. of his cases. It has never been reduced below 7 per cent. by the old operation with needling. Visual acuity of 6/vi and 6/v is quite common. There is great reduction of cases with about 6/xxxvi and moving bodies.

The operation requires as a rule but one dressing, the bandage being left off 6 to 10 days, a green shade then given and the patient allowed to go home.

The operation is not easy, but the difficulty lies in acquiring of proficiency in various devices to suit different conditions. It can not be acquired by watching and listening to a teacher, but must be practised under his supervision (Smith's?). The beginner working by himself concludes from burst capsules, escape of vitreous, failure to expel lens without too much force, that the operation is not practicable and gives it up in disgust and despair.

The assistant's office is important, as he has charge of proper exposure of the field of operation, and as in the English method the surgeon stands behind the patient instead of at the side the assistant has more to do to keep out of the way of the operator.

The order of ease of intracapsular extraction is: 1, immature; 2, intumescent and ripe swollen; 3, hypermature shrunken cataracts.

He thinks that statistics of novices at a difficult and extremely tricky operation are not a fair criterion, and that the comments and figures of those who have been taught the operation by Major Smith should be cited instead. The operation has no terrors for any one who has had enough experience, has a good assistant and knows how to vary his methods according to the varying circumstances. H. V. W.

IMPROVEMENTS IN THE TECHNIQUE OF THE EXTRACTION OF CATARACT.—HOWE, LUCIEN, Buffalo, N. Y. (*N. Y. State Jour.*

*Med., March*, 1909). The object of this paper is to describe a new fixation forceps and an instrument for facilitating the delivery of the lens in cases in which the corneal incision has proved too small. The fixation forceps are provided with two branches which fasten upon the belly of the internal and the external rectus muscle, the advantage being that the extremities will not tear out from the conjunctiva, the eye is prevented from rolling from side to side and there can be no twisting or distortion of the globe. Realizing the difficulties of enlarging the corneal section when found too small, the writer advocates the use of a pair of forceps resembling the straight iris forceps, except that a curve has been given to each blade near its termination of such a form that when the two points approach, they close upon each other in an arc whose chord is less than the length of the minimum incision made for a cataract extraction. When in the course of the extraction the operator finds the lens caught in the wound, the eye is rotated down with the left hand, the operator taking the cataract forceps in the right hand gently tips the lens sideways and with equally gentle traction, disengages it from its entanglements. C. H. M.

A CASE OF PYRAMIDO-ZONULAR CATARACT.—CHANCE, BURTON, Philadelphia (*Ophthalmic Record*, December, 1908. Woman, aged 24, with congenital lens deformity in each eye. The periphery of each lense is occupied by a diffused ring opacity, evidently zonular in character. The lens centers are occupied by pyramidal shaped opacities with apices pointing forward, the base resting at about the posterior poles. V equals 6/xv and 2/lx. No operative interference advised. M. B.

CONGENITAL CATARACTS WITH CALCAREOUS DEPOSITS.—MITCHELL, S., Hornell, N. Y. (*Ophthalmic Record*, December, 1908). A man of 25 years had a congenital cataract in his right eye. The center of the lens was densely white with a narrow transparent border. Two needlings were performed at intervals of 3 months. A distinctly gritty feeling was imparted to the needle when it encountered the dense white center. The white plaque fell into the anterior chamber, and was removed through a corneal incision. It was wholly a calcareous formation 3 mm. in diameter, and about as thick as writing paper. This form of congenital cataract is that described by E. Treacher Collins as "disc shaped," and the large amount of calcareous matter was due to the age of the patient at the time of its removal. M. B.

Some Unusual Cases of Operable Cataract.—Pfingst, A. O., Louisville, Ky. (*Ophthalmic Record*, March, 1909). A woman of 28 years. Had always been nearsighted. Symptoms present of congenital syphilis. Pupils displaced upward and inward. Lenses clear, but dislocated. They became opaque in 18 months. The lenses were absorbed after needlings at intervals of 3 or 4 months. Final vision 20/xl with —6 D. Case 2, a man of 34 years. History of always having been nearsighted. For a year right eye has been blind and vision of left very poor. The lens of left, the better eye, was dislocated into the vitreous ,and moved about with movements of the eye. The lens was removed with a wire loop and vision was obtained of 20/cc with a —2.00. The author has also operated upon two cases of dislocation of the lens into the anterior chamber, but the final visual results are not given.

M. B.

To the Pathogenesis of Cataract Caused by Lightning.—Kurabara, T., Matama, Bungo, Japan (From the eyeclinic of Prof. P. Roemer in the University of Greifswald, *Archiv fuer Augenheilkunde*, 63, p. 1). Carefully isolated lenses were weighed and exposed to the strong sparks of a Leyden jar. After remaining in a 0.95 per cent. salt solution, for from 5 to 20 hours, the lenses were again weighed and the albumen, which had filtrated into the salt solution, was precipitated by picric acid. By these experiments the anterior and posterior capsules were detached and the lenses had gained in weight in comparison to lenses which had not been exposed to the sparks. K. concludes that the lesion of the lens substance must be caused directly by the lightning, as in these experiments a disturbance of nutrition, to which cataract by lightning so far had been ascribed, was out of the question.

C. Z.

## CHORIOID.

Second Communication on Punctiform Atrophy of the Chorioid.—Hebb, H. (From the eyeclinic of Prof. P. Roemer in the University of Greifswald, *Archiv fuer Augenheilkunde*, 63, p. 73), adds a second case to his first observation, published in the *Archiv fuer Augenheilkunde*, vol. 59, which presented the following clinical picture: The disease commences with yellowish white round spots without pigment, at the extreme periphery of the fundus, without distressing symptoms. The affection gradually progresses towards the center. As soon as the macula is reached, the patients see a light veil before their eyes, vision becomes impaired and the visual field contracted. The older foci become surrounded by a pigment border, and fine granular pigment accumulates between the atrophic spots. C. Z.

## CIRCULATION.

Optico-Ciliary Vessels; Report of a Case.—Shoemaker, Wm. T., Philadelphia (*Ann. Ophthal.*, April, 1909). There are three forms of anomalies of this kind, the cilio-retinal vessel, the chorioido-vaginal and optico-ciliary. The latter is very rare, only ten cases having been reported. They are vessels which run from the central or papillary vessels to the disc margin and there disappear under the retina into the chorioid. The condition may be congenital or acquired during the progress of a papillitis, or glaucoma. The report of the author's case is accompanied by an illustration. M. B.

On the Anatomical Changes Producing the Ophthalmoscopic Image of Closure of the Central Retinal Artery by Direct Injury of the Orbit.—Von Michel, J., Berlin (*Zeitschrift fuer Augenheilkunde,* XXI., 1909, p. 116). So far an anatomic explanation of the cause of the opthalmoscopic picture of embolism of the central retinal artery by direct injuries of the orbit had not been found, until v. M. furnished it in the following case: The left orbit of a boy, aged 16, was injured by a bambus cane, followed by exophthalmus, profuse hemorrhages under the ocular conjunctiva and the typical ophthalmoscopic aspect of obstruction of the central retinal artery. The optic disc was pale and opaque from edema as well as the surrounding portions of the retina and the macular region which showed the well known red spot. The retinal arteries were slightly filled, the veins enlarged. Some venous hemorrhages were visible around the disc. The eye was blind, and the patient died after six days with the symptoms of tetanus. Exenteration of the orbit was performed and from between optic foramen and superior orbital fissure, a piece of wood, imbedded in offensive pus, was removed. Behring's antitoxin was injected into the dural sac. Guinea pigs inoculated with pieces of the wood and cerebrospinal liquor reacted positive.

From the detailed histological description we mention the condition of the central retinal artery. This showed a double obstruction: 1, by rolling up of the detached elastic and middle coats into the lumen and thus closing it, and 2, by a hyaline more central, thrombus which filled the whole lumen and lay close to the wall, in the whole artery from its bend in the axis of the optic nerve up to its union with the ophthalmic artery. Since the central retinal artery is a terminal artery, a hemorrhagic infarction might be expected after its closure. This does not occur as, according to Leber, a reversal of the venous blood current is prevented by the intraocular pressure.

The chief changes subsequent to the interruption of the arterial circulation, were necrosis of the axial nerve substance, the orbital portion of the optic nerve and venous stasis with edema of the optic disc, the inner retinal layers, hemorrhages and formation of folds of the retina. Edema and folds explain the ophthalmoscopic picture of opacity of the disc and retina, especially of the circumfoveal region, from ischemic necrosis of the layers of nerve fibres and ganglia. An opacity was lacking at the fovea, as, according to Leber, this contains only the external layers of the retina. Colored plates illustrate the anatomical conditions. C. Z.

CONDITIONS OF THE FUNDUS IN THROMBOSIS OF THE CEREBRAL SINUS.—BARTELS, MARTIN, Strassburg (From the aural clinic of Prof. Manasse, Strassburg, *Zeitschrift fuer Augenheilkunde,* XXI., 1909, p. 23), reports the clinical histories and autopsies of three cases of purulent thrombosis of the cavernous sinus, in which the ophthalmoscopic conditions had been confirmed by several ophthalmologists. The first case, a girl, aged 12 years, had been operated upon for thrombosis of the left transverse sinus and extradural abscess after otitis, with ligation of the jugular vein. Immediately after the operation, an intense bilateral phlegmon of the orbit set in. After 12 days slight choked disc was showed in both eyes, at the same time an abscess of the temporal lobe was diagnosed and opened. The patient died, 5 weeks after the commencement of the phlegmon, from another abscess of the temporal lobe. An old thrombus of connective tissue was found in both cavernous and deep petrosal sinuses. B. emphasizes that the fundus showed no changes at the time, when the thrombosis of both cavernous sinus existed, and that the choked disc set in with the temporal abscess.

In the second case, a girl, aged 36, the autopsy corroborated the diagnosis of bilateral orbital phlegmon with purulent thrombosis of both cavernous sinus, perhaps due to postpneumonic metastasis. The ophthalmoscope showed nothing abnormal at the time when the thrombosis existed. The optic neuritis, observed a few days later, was attributed to a purulent pachymeningitis, the purulent exudation of which had increased the intracranial pressure.

The third case presented purulent thrombosis of both cavernous sinuses of obscure origin, but there was no large accumulation of pus within the cranial cavity and no sign of optic neuritis up to death.

B. concludes from these cases, that the impeded outflow of blood from the central retinal vein into the cavernous sinus, which in all was impossible at the time of the ophthalmoscopic examination on account of the thrombosis, could not be the cause of choked disc. He assumes that, according to all recent anatomical and physiological investigations (Birch-Hirschfield, Krauss, etc.), the outflow to the facial and pterygopalatine veins was sufficient. They also spoke against the toxic theory of papillitis, especially case 3, as both orbits were filled with pus, and the cavernous sinus showed purulent thrombosis and still papillitis was lacking.

Then B. reports 3 cases of postoperative papillitis with the following common features: the papillitis developed after operation on the transverse sinus, and reached its acme in from the second to fifth week after operation. It was characterized by great prominence, hemorrhages and white patches. There was no visual disturbance, and it did not terminate into atrophy, but after from 2 to 3 months the fundus became almost normal. The etiology is unknown. Postoperative papillitis does not impair the prognosis and furnishes no cause for further operative procedures.

Finally B. calls attention to the difficulties which, in otitic diseases, may arise from the aspect of the pseudoneuritis, which is generally associated with hypermetropia. In such cases continued observations clear the condition or sometimes the examination of direct relatives of the patient. If these show a similar ophthalmoscopic image, as B. ascertained in 2 cases, the diagnosis of pseudoneuritis is established.

VALUE OF OPHTHALMOSCOPIC EXAMINATION IN THE DIAGNOSIS OF ARTERIOSCLEROSIS (*Colorado Medicine*, Dec., 1908). —When fully developed, arteriosclerosis can be recognized by the general clinician with no great difficulty. For purposes of diagnosis the general clinician interests himself with a study of the pulse by palpation, with the character of the first sound of the heart at the apex and the second sound at the aortic area, with the increased tidal wave on the sphygmogram and the elevation of arterial tension as recorded by the sphygmanometer.

If, says Stengel, these four symptoms were found in arteriosclerosis alone, the problem of diagnosis would be greatly simplified, but this is not the case. Any one of these conditions may occasion the four signs of arteriosclerosis. On the other hand, a consideratble and often very serious degree of arteriosclerosis may exist with a normal blood pressure.

In the eye, vascular changes are displayed with a clearness and minuteness nowhere else obtainable in the living body. Ophthalmoscopic examination is, therefore, the easiest and best clinical means we possess for detecting arteriosclerosis.

Briefly stated, these ophthalmoscopic signs include uneven caliber and undue tortuosity of the retinal vessels of such a character that a beaded appearance is produced. There is distinct loss of transparency of the arterial walls, which are often bordered by white stripes. The veins may also present the same appearance. There may be hemorrhages and edema of the retina. The most important sign, however, is indentation of the veins by the hardened arteries in the same manner as a solid rod would indent a rubber tube when lying across it. These ophthalmoscopic signs are produced by no other condition except arteriosclerosis.

Thic method of examination is indefinitely more delicate than the palpation of the radial or temporal arteries through the skin. If the findings are positive they are diagnostic, and in this respect have an importance which, as we have seen, far surpasses that furnished by the four classical, clinical symptoms of arteriosclerosis. Yet, when this has been admitted, there are certain limitations to the value of examination of the eyegrounds which must be mentioned. Pathological research has shown that angiosclerotic processes are almost always exceedingly irregular in their distribution. It is easy to prove that some patients have extensive intraocular arteriosclerosis without the least palpable rigidity of their radial or temporal arteries, and the reverse is also true. These facts detract in some degree from the value of the ophthalmoscopic evidence of general arterial disease, yet it remains the best indicator of the state of the vessels generally which we possess. Positive evidence is of more value than negative. When retinal vascular disease is present the prognosis is always grave; when absent, it is not necessarily good. H. V. W.

GROSS OBSTRUCTIVE VASCULAR DISEASE IN THE RETINA.—HARRIS, C. M., Johnstown, Pa. (*Ann. Ophthal.,* Jan., 1909). In a general sense, it may be said that certain conditions of the blood substances, the vascular coats, the vascular tension, or the blood current may cause obstruction. The exciting causes are emboli, thrombi, endarteritis, endophlebitis, arterial spasm, and —rarely—hemorrhage into the sheath of the optic nerve. The one great contributing cause is angioscleritis. Others are syphilis, pyemia, valvular heart disease, nephritis, chorea, autotoxemia, and the toxic effects of drugs and chemicals, such as tobacco, lead, quinine, phosphorus, etc. Treatment has been unsatisfactory. Nitrate of amyl. or nitroglycerine are usually given to increase the lumen of the affected vessels, and potassium iodide for its absorbing powers. If seen early, forcible ocular massage under cocaine anesthesia is occasionally successful. The author reports in detail six cases seen during the past five years. Four were cases of emboli, and two were cases of thrombi. The damage to vision in the last two cases was much less than in those affected with emboli, in each of which there was little final improvement. M. B.

BEGINNING SIGNS OF RETINAL ANGIOSCLEROSIS.—REBER, WENDELL, Philadelphia (*Ann. Ophthal.,* Jan., 1909). The recognition of angiosclerosis through change in the retinal vessels before the disease has advanced to a stage where its general recognition is unavoidable is the perfection to be striven for by the ophthalmologist. It must be borne in mind, however, that the retinal changes may be only a part of local angiosclerosis, and that these changes may never become general. The author points to the first sign of de Schweinitz as being of the greatest importance in the very early signs, namely, "A markedly corkscrew appearance of certain arterial twigs, either of those which skirt the macular, or more significantly of one or more small branches of one of the larger vessels." The third sign of de Schweinitz—the dull red nerve head—the author is inclined to look upon as a sign of established sclerosis. The author looks upon sluggish pupillary reaction and early failure of accommodation as important extra-retinal signs of angiosclerosis. The changes in the vessels of the highly vascular structures account for their inactivity under stimulation through the third nerve. M. B.

EMBOLISM OF THE MACULAR ARTERY AND THROMBOSIS OF SUPERIOR AND INFERIOR RETINAL ARTERIES IN A CASE OF EMBOLIC SOFTENING OF THE BRAIN.—SHOEMAKER, W. T., Philadelphia (*Ann. Ophthal.,* Jan., 1909). The patient was a Jewish woman, aged 41, who died from cerebral embolism. The presumption is that the ocular embolism occurred at about the same time as the brain embolism, or shortly after. The eye was enucleated and subjected to careful pathologic study by Chas. H. Hosmer, whose report is given at considerable length. The article does not lend itself well to review.

M. B.

## CONJUNCTIVA.

THE TREATMENT OF SPRING CATARRH.—ZIRM. Olmutz (*Wochensch. f. Therap. u. Hyg. des. Aug.,* July, 31, 1908), has found that the wearing of dark gray spectacles from the first indication of the return of the trouble is of the greatest advantage. All irritants must be avoided. He has found that adrenalin and similar preparations, together with an ointment consisting of sol. of sublimat (1:1000) 4, vas. flav. Amer., 20. are of service. The solution to be used twice daily and the ointment twice in the interim. W. Z.

CONJUNCTIVITIS AND ITS RELATION TO SUPERFICIAL KERATITIS.—SCHIOETZ, HJ. (*Medicinsk Revue,* December, 1908, Christiania, Norwegian). The inflammations of conjunctiva are to be divided into two main groups: (1) those which do not leave permanent changes of structure of the membranes, and (2) those which do leave more or less alterations. The former group comprises the various forms of conjunctivitis.

and the latter includes trachoma, diphtheria, tuberculosis, pemphigus.

The most characteristic feature of conjunctivitis is the discharge; its quantity and nature is proportional to the degree of the inflammation. Every case of conjunctivitis, though inoffensive to the mucous membrane itself, involves more or less danger to the cornea, a small lesion of the epithelium, that may easily be produced by rubbing of the eye, opens the door to the bacteria. Almost every case of keratitis is due to a primary conjunctivitis. This is why the treatment of conjunctivitis is a matter of importance.

The most important point of the treatment is to keep the mucous membrane clean by means of an indifferent aseptic fluid; Anton prefers a tepid solution of boracic acid. The best medicament is nitrate of silver, ½ per cent. and only once daily; the substitutes, protargol and argyrol, are not reliable. Sulp. of zinc ½—1 per cent., is less effective, but does no harm and may be given into the patients' own hands. This treatment is sufficient also when complications arise; so Author dissuades from the extensive use of the yellow ointment for phlyctenular conjunctivitis, except for accompanying blepharitis and eczema; any discharge contradicts the ointment. By keratitis is atropine only to be used when there is tendency to iritis; one is to be very careful for serpent ulcer, when the tension is often increased. For purulent ulcers Author recommends canterization alone, or combined with iridectomy.

For ophthalmia neonatorium: Frequent washings with boric acid solution, in the first days every quarter of an hour, instillation of argyrol every hour, and application of nitr. of silver ½ per cent. once daily to the averted lids. The most important point of the treatment is the careful cleaning of the eyes.

E. S.

The Conjunctivites (Des Conjunctivites Oculaires).—Vaillancourt, Joseph (*Le Bulletin Médical de Québec,* Sept., 1908; Jan., 1909).

This paper has been written for the benefit of the general practitioner, and in consequence a great deal of elaboration and detail has been omitted. The occurrence of such a large proportion of cases of disease of the conjunctiva in ophthalmic practice warrants the selection of his subject. Although the writer approves of Morax's classification, according to the etiological factor at work, and Terrien's idea of a classification according to anatomical and clinical changes, he does not adhere to his convictions, but arranges the acute forms as catarrhal, purulent and pseudomembraneous.

Of the acute catarrhal forms the author states that the Koch-Weeks bacillus is responsible for 70 per cent. of these. He discourages the use of bandages and recommends the use of smoked glasses with irrigations of tepid boiled water frequently and instillations of zinc sulphate in a 1 per cent. to 2 per cent. solution. In severe cases silver nitrate should be applied by the surgeon.

In purulent conjunctivitis due to the gonococcus, he follows the general rule of frequent irrigations of the cul de sac with tepid water and the application of silver nitrate 2 per cent. once daily, as well as the use of atropine when the cornea is threatened. When the disease is confined to one eye, Buller's shade is advocated. Credé's procedure is always followed in doubtful cases as a prophylactic measure.

Cases of pseudomembraneous conjunctivitis due to the Klebs-Loeffler bacillus may be light or severe. In the former, one may find marked oedema occluding the upper orbito-palpebral ridge, and when the lids are able to be everted, a false membrane is seen which can be rubbed away, leaving a reddened blood stained mucosa below. The preauricular ganglion is not involved, as it is in the severe type of the disease where the membrane is adherent to the mucosa and where the disease is at its height in twenty-four hours. Twenty c. c. of antitoxin are recommended to be given at once and repeated the second day if symptoms have not begun to clear up. Iodoform vaseline is advocated where the cornea is threatened, and a shield may be applied to a non-infected eye. A prophylactic dose of 10 c. c. of serum should be given to every member of the household.

Chronic forms of conjunctivitis are classified as: Hyperaemia of the conjunctiva, phlyctenular conjunctivitis, follicular conjunctivitis ,and trachoma. In all cases of hyperaemia produced by irritation, the removal of the exciting cause as dust, foul air and smoke, is recommended; while the importance of a correct refraction is strongly emphasized. For the relief of phlyctenules of the conjunctiva or of phlyctenular kerato-conjunctivitis alteratives for the improvement of the child's general health are prescribed, adenoids removed, and the eye put at rest by the use of atropine and smoked glasses. In cases of follicular conjunctivitis, the follicles are seen about the lower cul de sac and they are generally arranged in rows. They are easy to detect, and are treated by correcting errors of refraction, but attention to the lymphatic system and by applying the alum pencil to the mucous membrane. Trachoma is dispensed with altogether too briefly. The author has made the statement that owing to the rigid quarantine examination that not more than twenty cases of the disease had been seen at the Hotel Dieu in the past six years. On account of the supposed rarity of the disease, he refrains from giving any particular description of it, and although he confesses that treatment is difficult, he says absolutely nothing about it.

Morax-Axenfeld conjunctivitis, as well as several other forms of conjunctivitis, are not included, and in more than one instance an intelligent description of the tissue changes is lacking. F. T.

THE THERAPEUSIS IN CONJUNCTIVAL INFLAMMATIONS.—F. C. TREBILCOCK (*The Canada Lancet,* January, 1909).

The object of the paper is a plea for a more rational and intelligent treatment of inflammatory conditions in the conjunctiva. In the writer's opinion a polypharmacy is unfortunately resorted to by the general practitioner which would be quite unnecessary were he to be but moderately observant and notice the character of the disease with which he is dealing.

Some of the more common remedies are taken up and their uses and advantages are explained. The dangers of lead acetate are emphasized and the writer seems a little severe in his condemnation of silver nitrate. His points are on the whole well taken and he is unwilling to have the drug in the patient's hands, but prefers to apply it himself.

Regarding the therapeutic value of heat and cold, in the opinion of the writer, cold is indicated in every case except those in which there is intense chemosis or any other condition, or when conjunctival disease is manifest in anemic subjects.

F. T.

CHRONIC CONJUNCTIVITIS AFTER ABLATION OF THE LACRIMAL GLAND.—TROUSSEAU (*Annales d'Oculistique,* February, 1909). Trousseau reports several cases of unusually obstinate chronic mucopurulent conjunctivitis occurring in patients upon whom ablation of the lacrimal gland had been performed. He gives no explanation of the genesis of the disease. G. C. H.

INVESTIGATION OF SAMOAN CONJUNCTIVITIS.—ROSSITER, P. S., U. S. Navy (*United States Naval Medical Bulletin,* October, 1908). Thinking it unlikely that in a region where gonorrhea of the genitourinary tract is quite rare, the great frequency of a severe conjunctivitis should be attributable to that disorder, R. investigated the condition. He terms the prevalent type "Samoan conjunctivitis," describing it as "a distinct, acute infectious disease characterized by rapid onset, severe pain, photophobia, a high grade of conjunctival inflammation (soon becoming purulent), a tendency to corneal destruction over greater or less areas; and the presence in the discharge often in pure culture of its etiologic factor, a distinct micrococcus." The author holds it to be probably the *Micrococcus catarrhalis.* The various salts of silver present the best treatment. H. V. W.

THE FREQUENCY AND CORNEAL COMPLICATIONS OF OPHTHALMIA NEONATORUM.—WHARTON, JOHN, Manchester (*Ophthalmoscope,* Jan., 1909). According to the reports of the Manchester Royal Eye Hospital from 1870 to 1882, the number of cases of ophthalmia neonatorum steadily increased, at which time a prophylactic crusade against the disease was begun in Manchester. From 1882 to 1907 the disease has steadily declined, and during 1907 the number of cases was less in proportion to the total number of eye patients from all causes than during any year since 1882. From 1882 to 1907 there were 7,108 cases of the disease, and the cornea (one or both eyes) was involved in 1,257 instances, giving a percentage of 17.6. M. B.

## CORNEA.

PUSTULE OF THE CORNEA IN VARICELLA.—OPPENHEIMER, Berlin (*Wochensch. f. Therap. u. Hyg. d. Apg.,* April 8, 1909), has observed as a complication of varicella the formation of a postule on the cornea. The condition seems to be rare. W. Z.

REPORT OF A CASE, NEURO-PARALYTIC KERATITIS.—KIMBERLIN, J. W., Kansas City, Mo. (*Ophthalmic Record,* Dec., 1908). A girl, aged 11, without known cause, developed a dryness of both cornea. The right cornea became entirely opaque, dry and scabby with vision nil. The left cornea has not advanced so far, and vision is 1/60. Both corneas are totally anesthetic. No efforts at nictitation. The condition does not have the appearance of a xerosis. The conjunctivae are normal. The author classifies it under neuro-paralytic keratitis, but is unable to find a parallel condition in the literature, and does not give it a name. M. B.

To the Anatomy of Keratoconus.—Newolina, Apollinaria, of St. Petersburg (From the Eyeclinic of Prof. E. Fuchs in the University of Wien. *Beitraege zur Augenheilkunde,* Heft. 71 ,1909, p. 1). A woman, aged 24, with bilateral keratoconus, stated that she always had had good vision. Two years ago the sight of her right eye became diminished and one year ago that of her left eye. The apices of the cones were outward and opaque. The opacity consisted of white stripes in different directions, forming a white conglomeration at the apex. Otherwise the eyes were normal. Corneal radius less than 4.5 mm. equals 65D. V. R. fingers at 3 m., L. at 2 m. In atropin mydriasis, a round piece of 1.5 mm. diameter of the left keratoconus was excised with the smallest obtainable trephine, and the eye bandaged without cotton. The anterior chamber was restored after a month. An anterior synechia which had formed during that time was torn by atropin. When the patient was discharged, the cornea was much flatter, the central scar sharply defined, anterior chamber deep, iris free all over, lens clear, T. normal.

The histological conditions are illustrated on horizontal sections and show a thickening of the epithelium diminishing from the periphery towards the center. Its basement layer forms zigzags, caused by proliferations of young connective tissue which grew from the defects of Bowman's membrane in the shape of ridges and nodules. The destruction of Bowman's membrane at the vertex was so great, that it had disappeared entirely at places. No blood vessels could be found in the connective tissue. Probably the more superficial conglomerate greyish opacities corresponded to the thickening of the epithelium and the proliferations of connective tissue. C. Z.

Ulceration of the Cornea; Some Points on Etiology and Treatment.—McKee, S. H. (*Montreal Medical Journal,* February, 1909).

After summarizing the very large proportion of diseased processes occurring in the cornea, the writer attributes the occurrence of these conditions to poor reparative changes in this tissue, more particularly at its central part, where ulceration most frequently occurs. An intelligent appreciation of the etiological factor at work is essential in order to proceed with treatment and to obtain the most satisfactory results.

A series of 41 cases is given, the large proportion of which were due to the Morax-Axenfeld diplobacillus. A systematic bacteriological examination should be made before a diagnosis is established or treatment commenced. The efficacy of zinc sulphate in ¼ per cent. solution brought about satisfactory results in all these cases, which might have gone on to much more dense scar tissue formation had other methods been employed or the treatment of zinc delayed.

As it is the object of the surgeon to retain as much of the healthy cornea as possible, the actual cautery is only recommended in the more extreme cases of ulcus serpens, due to the pneumococcus. F. T.

Contribution to the Etiology of Corneal Ulcers.—Rosenbauch, Edmund (From the Eyeclinic of Prof. Wickerkiewicz and the Institute of Microbiology of Prof. Nowak in the University of Krakau. *Klinische Monatsblaetter fuer Augenheilkunde,* XLVI., 11, 1908, p. 514), describes a case of serpent ulcer with hypopion of the right eye in a woman, aged 50, which healed with dense leucoma. Of the material of the ulcer, R. cultivated on agar a microorganism, which partly resembled bacteria, partly by its filiform ramifications mycelia, partly by spindle shaped thickenings chamedospores, partly by round forms conidia. To simplify matters he called it "keratophyton," and studied its properties on the eyes of rabbits and guinea pigs, for which it proved pathogenic. Its action was clearest, if it was, in sterile water, introduced into the anterior chamber of guinea pigs, being followed by purulent infiltrations, iritis, opacities of the cornea, i. e., symptoms which also had been observed in the patient. By experiments on mice R. ascertained the general pathogenicity of keratophyton for mice, in which subcutaneous injections caused general infection. Its toxicity is increased by its passage through animals.

The treatment of the case, according to the method of the

clinic, with pyoctanin, dionin and alcohol dressing, proved, as in many other cases, very successful, and is urgently recommended. The disagreeable stains of pyoctanin can easily be removed with aqueous solutions of hydrochloric acid. Three microphotographs illustrate the different forms of keratophyton.
C. Z.

ON THE TREATMENT OF SERPENT ULCER.—DEUTSCHMANN, R., Hamburg (*Beitraege zur Augenheilkunke*. Heft 71, 1909, p. 6). In this article D. reasserts those facts with regard to his serum, which by the discussions of P. Roemer in the Deutsche Medicinische Wochenschrift, 1908, No. 34 and 42 (review in Ophthalmology) must appear displaced. Deutschmann's serum is not bactericidal and does not act as an antitoxic. It is a yeast serum, and makes, by ingestion or subcutaneous injections, animals, with experimental eye affections by staphylococci, streptococci or pneumococci, more resistant, so that a direct curative action on the infectious process may be produced. He explains the polyvalence of his serum by the assumption, that his serum provides the cells, which in the organism form antibodies, with fresh nutritive material, and fresh energy in form of a chemical substance, as yet unknown to him, so that these cells can take up with increased forces the struggle against the introduced morbid agents, respectively remain victors in the struggle. D.'s serum is, even in very high doses, absolutely harmless, so that every danger from diseases caused by serum (which have been observed after Roemer's pneumococcus serum) is excluded. D. mentions his own results and those of others, obtained with his serum, to prove its therapeutic value. C. Z.

KERATITIS PUNCTATA SUPERFICIALIS, WITH A REPORT OF A CASE.—WIENER, M., St. Louis (*Arch. Ophthal.,* March, 1909, xxxviii, 120), reports a case of superficial punctate keratitis resembling those cases reported by Major Herbert, of Bombay, in 1901. In the author's case, the central part of the cornea was covered by a number of small round greyish dots about 1 mm. in diameter and raised above the surface. They were visible only by oblique illumination or under most favorable reflection in daylight, and involved the superficial layers of the cornea.

Under antiseptic treatment, the elevated spots disappeared rapidly, but left grayish dots, which later disappeared.

W. R. M.

## GENERAL DISEASES AND THE EYE.

The Systemic Factor in Disease of the Eyeball.—F. C. Treibilcock (*The Canada Lancet*, May 1909).

The writer limits his remarks in this paper to some affections of the uveal tract in which certain definite lesions are produced, for which recognized systemic diseases as syphilis, rheumatism, gout and some of the anemias are responsible; included with these are nephritis and diabetes, all of which constitute a systemic dyscrasia. The paper is a plea for the study of the patient as an individual and to recognize and treat the underlying cause as well as the symptoms manifested in the eye. The importance of such an early diagnosis of the underlying cause and of its prompt, yet frequently inconvenient and wearisome attempt at elimination of the toxins primarily responsible for the onset of the pathological processes is duly emphasized. In other words, the treatment of the eye must not consist in the treatment of the organ only, or in the therapy of the symptoms which it manifests. The etiology must be arrived at only by a process of exclusion, and when syphilis, gonorrhoea, tuberculosis and rheumatism, as well as any local focus of pyaemia, as disease in thé accessory nasal sinuses and pyorrhoea alveolaris in the teeth may be counted out, one may direct one's attention to faulty metabolism as a cause.

Some of the lesions responsible for a subsequent glaucoma are described and a few points in regard to treatment are given. The tendency of a too exact classification of morbid processes, only results in permanent harm to medicine if it ever distracts the physician's mind from the great importance of the wider view.

F. T.

A Case of Bilateral Metastatic Ophthalmia After Scarlet Fever.—Behse, Emil (From the eyeclinic of Prof. O. Schirmer in the University of Strassburg, *Archiv fuer Augenheilkunde*, 63, p. 6), reports an atypical case of scarlet fever in a boy, aged 8 years, without exanthema, but desquamation. It commenced with chills, vomiting, diarrhea, swelling of the joints and drowsiness. On the fourth day hypopion, petechiae and pustules developed, with sudden rise of temperature, which had been normal. On the seventh day endocarditis set in. The affection of the eyes turned into a subacute fibrino-purulent uveitis with diffuse gray infiltration of the vitreous, with destruction of both eyes under the aspect of phthisis. The cultures from the blood, made on the sixth day, were sterile; those from the exudation in the anterior chamber showed staphylococci.

Undoubtedly, it was an extremely rare form of scarlet fever, the hemorrhagic, caused by a septic infection with staphylococci. The ocular affection was attributed to a direct infection of the eyeballs from the blood by septic metastasis (staphylococci).
C. Z.

CHRONIC IDIOPATHIC INTERNAL HYDROCEPHALUS WITH PARTICIPATION OF THE FOURTH VENTRICLE, FIRST DIAGNOSED, THEN VERIFIED BY PUNCTURE, AND CURED BY DRAINAGE OF THE LATERAL VENTRICLE.—HALBEN, GREIFSWALD (*Deutsche Medicinische Wochenscrift,* 1909, No. 10, p. 438). A girl, aged 16, complained of headaches, impairment of vision and diplopia. H. found intense paresis of left aducens, bilateral papillitis with an elevation of 6 D., i. e., 2 mm. V. almost ½, L. almost 1., pupils from 3.25 to 3.5 mm., nystagmus in extreme lateral fixation, tremor of head and hands. The patient had always had headaches, but more intensely during the last six months, in which period she had vomiting, for from one to two days, three times. She was well nourished, and there was no indication of lues, tuberculosis or spinal disease. H. discusses the various points which led him to the diagnosis of chronic hydrocephalus of the fourth ventricle; especially when tumor could be excluded on account of the chronicity. As two punctures of the right lateral ventricle by Prof. Payr transiently reduced the papillitic swelling to 3.0 and relieved the headaches, the operation for permanent drainage of the ventricle was performed. After reflecting a skin-bone flap of the parietal bone, about 2 cm. from the longitudinal sinus, a trocar, 2 mm. wide, was introduced into the right lateral ventricle. At a depth of 5.6 cm. a stream of liquor spurted out. The trocar was replaced by a specially prepared and hardened calf's artery, which connected the ventricle with the epidural and subdural spaces, the wound was sewed and the skull at this region fenestrated. Four weeks later all symptoms had disappeared, the discs were scarcely prominent, but had a dirty, slightly reddish grey color, with somewhat indistinct borders, the lumen of the vessels was almost normal; V. was normal. C. Z.

ACUTE PURULENT CEREBRO-SPINAL (EPIDEMIC?) MENINGITIS WITH HEMIANOPSIA AND HEMIANOPIC PUPILLARY REACTION.—GINSBERG, S., and DESSAUER, P., Berlin (*Centralblat fuer Praktische Augenheilkunde,* 1909, p. 34). In the first weeks of a purulent meningitis, probably caused by meningococci, in a woman, aged 40, a left-sided hemianopsia with large central defect of the right visual field was observed. Ten weeks after the beginning of the affection the right eye showed simple atrophy of the optic nerve, the left slight pallor of the temporal quadrant. Four weeks later hemiopic pupillary inaction was ascertained, which later on, appeared only occasionally and indistinctly. The right pupil showed transient reflex immobility. Finally both pupils responded only to central normal. The right central scotoma gradually subsided, vision of both eyes improved, especially the right. The ophthalmos copic aspect remained unaltered.

Although G. fully acknowledges the observations of Hess, that the pupillometer area of the retina is confined to the center, in a diameter of less than 4 mm., he considers the occurrence of hemiopic pupillary inaction, by the so far incomplete methods, established. For if in a great number of examinations a reaction to light, impinging from the seeing side never occurred before the light came directly from in front, the sources of errors, as diffuse, diascleral light, cannot explain this typical behavior of the pupil, as these are always cooperating, whether light enters the eye from the temporal or nasal sides. The general conception ought to be thus rectified, that for apparently very peripheral entrance of light as soon as pupillary reaction occurs. The assumption seems justified that even such a small area, as postulated by Hess, may be reached by diffuse light at is margin, without the whole area being illuminated sufficiently for eliciting a reaction. Therefore if in a pathological case both margins differ as to reflex sensibility or conduction, we may expect different reactions of the pupils.

The seat of the affection was most likely in the right optic tract, not in the occipital lobe, because all symptoms for a cortical lesion (disturbance of orientation, preservation of the macula) were lacking. This assumption would also explain all symptoms from one focus. The miopic inaction points to the seat before the primary optical ganglia. The fibres of the right optic nerve coming from the left tract were at first damaged. Therefore the affection encroached in the beginning directly or indirectly on the chiasm in front and to the left, so that a large portion of the crossed fibres of the optic nerve did not functionate. Notoriously the crossed fibres lie in the chiasm at the nasal side, enclosed upwards and outwards, outwards and downwards, by the uncrossed fibres. The localization was perhaps due to a circumscribed encephalomeningitis in the tract, caused by the meningococci, in addition to the diffuse purulent meningitis. C. Z.

AMAUROTIC FAMILY IDIOCY: HISTOLOGICAL EXAMINATION OF A CASE IN WHICH THE EYES WERE REMOVED IMMEDIATELY AFTER DEATH.—VERHOEFF, R. H., Boston (*Arch. Ophthal.*, March 1900 xxxviii., 107), gives the pathological findings in a case of amaurotic family idiocy in which the eye was removed fifteen minutes after death. The only demonstrable changes in the retina were confined to the ganglion cells, which were markedly degenerated, and the author concludes that "the ophthalmoscopic picture of this disease is due to degeneration of the retinal ganglion cells about the fovea, and to the contrast thereby produced." In this respect he confirms the theory advanced by Holden. No hole was found in the macula as described by Parsons. The greatest amount of degeneration of the ganglion cells was in the macula and the degeneration of the optic nerve was most marked on the temporal side. The optic nerve entrance presented the appearance regarded as characteristic of myopia. A clinical description of the case is given. W. R. M.

EXOPHTHALMIC GOITRE, ACCORDING TO MODERN VIEWS.—LANDSTROM, JOHAN (*Almänna svenska läkaretidning,* No. 48, 1908, Swedish).

Besides the three classical symptoms, there are a large number of others, arising from troubles of the nutrition, of the intestinal tract, the skin, the urogenital apparatus, the nervous system, etc. Kocher has pointed out two new signs, which the author has been able to confirm: A stiff expression of the eyes (not to be confounded with Stellwag's sign), being often the very first sign of the disease, and an alteration of the blood; a considerable reduction in number of the neutrophile, polynuclear white corpuscles—a point of great importance for the diagnosis and the prognosis.

As to the nature of the disease, the author considers the thyroid theory, advanced by Moebius and Kocher, as generally acknowledged nowadays. One must remember, that the histological changes by Graves' disease are specific, and that they may be diffuse or circumscribed; a small enlargement of the thyroid may thus give highly pronounced symptoms; a great enlargement, slight ones, when a colloid degeneration prevails over the specific changes.

As to the etiology, L. points out the frequency of infectious diseases, especially rheumatic fever, angina, etc. He has seen several cases, following angina, whose course was a very acute one so that they were mistaken for acute endocarditis.

As to the pathogeny of the exophthalmos, author repudiates the former theories. The protrusion is due to contraction of a muscle, newly discovered by the author. This muscle consists of unstriped fibres, cylindrically arranged, going from septum orbitall to the ring of connective tissue at the eyeball's equatorial part; the medial fibres are the strongest. Claude Bernard's classic experiment, the producing of exophthalmos and widening of the lid aperture by irritation of the sympathetic nerve, shows that the muscle in question must be innervated from sympathicus. A slight irritation gives a certain stiffness of the eye (the above mentioned "Kocher's" sign); a stronger one gives Stellwag's symptom. Graefe's sign is also due to its contraction, as well as Moebius's sign (insuffic. of convergence), according to the prevalence of the medial portion of the muscle.

The prognosis is proportional to the heart's symptoms. The mortality is larger than commonly admitted, perhaps about 25 per cent.

The medical treatment is of little or no value. Iodine is ineffective or directly injurious; author warns earnestly against the use of thyroidine. Moebius's antithyreodine, as well as the use of Roentgen rays, seems to be rather worthless. Removal of the sympathetic nerve has not come up to the expectations.

The only valuable treatment is the operation of the struma. There are three different methods: Ligature of the arteries, removal of the one lobe of the thyroid, and a combination of both of them. The author recommends the latter; he makes the ligature of the upper artery on the side, where the lobe is smallest, and removes the other lobe. The main principles of the removal are: Local anesthesia, a large wound, that all may be easily accessible, preliminary ligature of the vessels, careful dissection of the glands from the subjacent layers.

Immediately after the operation an aggravation of all the symptoms is generally observed. After a few days the convalescence takes place; but its course is very slow, demanding about one year. In inveterate cases, the hypertrophy of the heart and the protrusion of the eyes generally remain, permanent changes of the tissue having taken place.

The author's conclusion is as follows: The operation is the only valuable treatment. In the early stages it is indicated for all cases; in the more advanced stages, too, when only the general state of health is not hopeless. E. J.

FREQUENCY OF HEREDITARY OCULAR SYPHILIS AND A STUDY OF ITS RUDIMENTARY STIGMATA. — GONZALEZ, JOSE DE JESUS, Leon, Mexico (*Special Report at the Third Annual Meeting of the Mexican Ophthalmological Society and Annales de Oftalmologia*, March, 1908).

The author studies the following: I. Frequency of ocular hereditary syphilis: (a) in relation to the total number of eye diseases; (b) in 50 children of well proven syphilitic parents. II. Rudimentary stigmatas of ocular inherited syphilis.

I. (a) Among 3,000 eye patients, he found 68 cases of ocular inherited syphilis, classified as follows: Interstitial keratitis, 42; ulcerous keratitis, 11; kerato-malacia, 1; iritis, 2; disseminated chorioiditis, 1; retino-chorioiditis, 1; pigmentary retinitis, 1; cataract, polar posterior 1, and zonular 1; iris coloboma, 1; microphthalmia, 1; buphthalmos, 1; strabismus, 2; and ptosis, 1.

I. (b) In order to find out the real frequency of ocular inherited syphilis, in children of syphilitic parents, the author studied 50 children of well proven syphilitics, examining them minutely from an ocular point of view, and he found that 36 per cent. of these children suffered from eye changes.

The proportion of ocular inherited syphilis was not the same in all the families observed, which were 15 in number; the circumstances which cause a variation in the frequency of the inheritance are three: 1st—The age of the parental syphilis at the time of marriage; the nearer the marriage takes place to the primary inoculation, the greater are the probabilities that the children will suffer from inherited syphilis; hence the first children may suffer from syphilis, whilst the last, born when the parental infection is old, are found to be healthy. 2nd—The virulence of parential syphilis; and 3rd—the constancy with which the specific treatment has been followed by the progenitors.

The foregoing shows where the real prophylaxis of ocular inherited syphilis rests; prevent the marriage of syphilitic persons near the time of the chancre, and, when this is not feasible, subject the married couple to a mixed treatment well carried out.

The author deduces from his observations that interstitial keratitis is a direct result of syphilis and not of a dystrophic origin; for, in the first place, the greater number of cases is observed in children born in the active epoch, and, in the second place, the specific treatment is efficacious.

The frequency of corneal manifestations and the rareness of inherited syphilitic localizations in other parts of the eye are worthy of note.

Antonelli affirms that among young persons with inherited syphilis, many have strabismus. The author among 50 children of syphilitic parents, has found 5 with strabismus, that is, 10 per cent; but only 18 with inherited syphilis, the proportion with strabismus being 27.7 per cent.

II. Ophthalmoscopic Rudimentary Stigmatas of Inherited Syphilis.—He thinks that this name should be reserved for the traces *left in the fundus of the eyes by infirmities that have completed their evolution during the fetal life,* and, in adults, *are incompatible with the functional integrity of the organ.*

The stigmatas which the author found are: 1st—Vascular; perivasculitis lines or the arteries transformed into white strings, changes which, of themselves, suffice, in persons who have not suffered from the eyes, to make one suspect hereditary syphilis. 2nd—Collections of pigment surrounding the branches of the central artery of the retina. 3rd—Atrophic whitish patches of chorioiditis disseminated near the vessels. (These latter two stigmatas indicate the subordination of the lesions of the fundus of the eye, to the vascular changes.) 4th—

A peripapullar pigmentary frame. Antonelli, who has described it, grants it a great diagnostic value. In order to judge its value, the author has made a comparative study of 50 children of syphilitic parents and 50 children of nonsyphilitic. Among the children of syphilitics, 74 per cent present peripapillar pigmentation, and among those who suffered from other inherited syphilitic manifestations all, except one, had Antonelli's frame. Of the 50 children of non-syphilitic persons, 34 per cent. presented a certain peripapillar pigmentation, but of a very mild tone, limited to a lateral sector and extended in a very narrow zone, sometimes even lineal. An abundant and very black peripapillar pigmentation constitutes a mark of inherited syphilis.

Of the 50 children of syphilitic persons, 9 were ametropic, and of the 50 children of non-syphilitic persons, 9 were ametropes; inherited syphilis has no influence on the production of ametropy. J. DE G.

CONJUNCTIVITIS FROM INFLUENZA (PFEIFFER'S BACCILLUS. —DEMARIA, ENRIQUE B. (*Anales de Oftalmología*, Mexico, July, 1907).

Conjunctivitis from influenza is due to the development *in situ* of Pfeiffer's baccillus, and may evolutionize either as a complication of grippe or as an independent affection, or it may precede the attack of influenza.

The evolution and symptomatology of this conjunctivitis are peculiar and well defined, owing to the works of Jundell and of zur Nedden in 1900.

The author has observed a typical case: M. C., Argentian, 12 years old, antecedents unknown, had first one eye attacked, and on the following day the other; beginning abrupt, smarting pain, edema and redness of the eyelids. On examination: Edema of the eyelids, which were reddish, intense blepharospasm and photophobia; serous secretion with mucous flakes; conjunctives red and odematose; corneas unaffected; myosis; preauricular ganglions swollen and slightly painful coryza and light fever present. The treatment by applications of nitrate of silver 2 er cent. and drops of cocadrenine effected a cure in 4 days.

An examination of the secretion showed Pfeiffer's baccillus, coloring the secretion with fuchsine solution. There are seen fibrine nets, polynuclear leucocytes and epithelial cells of the conjunctiva; among the cells and even inside is Gram negative and takes fuchsine; it is seen isolated or in groups, very small (1, 2u X 0.5 u), almost a coccus, with one end more rounded; it is easily distinguished from the Koch-Weeks baccillus, which is thinner and finer throughout. Another distinctive characteristic of the two baccilli is that the Koch-Weeks disappears after treatment or even spontaneously, while that of influenza persists.

The cultures which the author made on ordinary mediums and on ascitic agar and agar with blood, placed in a thermostat, at 37 degrees, gave colonies typical of influenza; at from 24 to 48 hours, transparent little drops are seen, like dew, and with the microscope, 60 diameters, are seen to be structureless. In cultures it is difficult to distinguish the baccilli of Koch-Weeks and those of Pfeiffer and they have been thought to be the same; but with the microscope they are distinguished, and the vitality of the two is distinct, that of influenza being more enduring and capable of cultivation.

Besides, the pathogenesis is another diagnostic point; the Koch-Weeks baccillus is only pathogenic for the human conjunctiva, while Pfeiffer's continually attacks other organs. The Koch-Weeks baccillus is not pathogenic for any animal, whilst Pfeiffer's is pathogenic for the monkey.

Conjunctivitis from influenza has a predilection for children, and it has even been known to produce ophthalmia, similar to that of the gonococcus of children in arms. J. de J.

Some General Considerations Concerning Tuberculosis of the Eye.—Verhoeff, F. H., Boston (*Ophthalmic Record*, Dec., 1908). He classes ocular tuberculosis as secondary, and divides it into acute, chronic and phlyctenular. The acute type is characterized clinically by its tendency to destroy the eye, and histologically by caseation of the lesions. The chronic type is characterized by its slow course, its tendency to exacerbations and remissions, and by the absence of caseation. It does not lead to complete destruction of the eye, but usually to atrophy of the eye to a greater or less degree. When occurring as nodular scleritis or sclerokeratitis, it has long been recognized as presenting a characteristic clinical picture, but has been ascribed mainly to other causes, notably to rheumatism and to disturbances of menstruation. The diagnostic value of tuberculin has left no doubt as to the true cause in these cases. These patients are usually in seemingly good physical condition. Other physical signs of tuberculosis are found only after careful search. It seems likely that the primary lesions are mesenteric or bronchial lymph glands, and that infection takes place by way of the intestinal tract and lymphatic system. The chronic character of the process may be due to great natural resistance, to low virulence of the infecting bacilli, or to the latter belonging to the bovine or avian type. The treatment calls for combined fresh air, proper diet, rest, and the use of Koch's old tuberculin. The author has great faith in the tuberculin. He thinks a sharp reaction should be produced and then its administration regulated to a point that does not produce reaction. However, he does not see any objections to increasing the dose occasionally to a point of sharp local reaction. The tuberculin should not be given during the menstrual periods. He thinks it may not be strictly correct to speak of phlyctenular keratitis as a local tubercular lesion, but he believes that it is always dependent upon systemic tuberculosis. He thinks the ocular lesions may be responsible to the phenomenon of anaphyloxis. He thinks the ophthalmic test should never be used to determine an ocular tuberculosis. The cutaneous test is more reliable, but the subcutaneous test is the most reliable of all, and it should not be considered negative until it has successively been tried and failed to give reaction. M. B.

Herpes Zoster Ophthalmicus with Involvement of Cornea and with Oculomotor Paresis.—Chance, Burton, Philadelphia (*Ann. Ophthal.,* April, 1909). A lady of advanced years was seized with a dull continuous pain in left side of face, which was followed by redness and then by an eruption of vesicles on the nose, cheek and brow. The eyeball became painful and tender after a few days. An annoying diplopia set in. The eyelids became involved in the herpetic process, and finally the eyeball and cornea. The eyeball turned downward and outward with paralysis of upward and inward rotation. The treatment was directed toward the correction of an intestinal toxemia and eventuated in a perfect cure. M. B.

A Case of Mikulicz's Disease.—Randolph, R. L., Baltimore, Md. (*Ophthalmic Record,* Jan., 1909). The case of a negress, 30 years of age, is reported, who first developed swelling of the lacrimal glands of each eye, without involvement of surrounding tissues or inflammatory symptoms. She was put on K. I. and the swelling disappeared in about three months. The parotids then began to swell, and in two months' time were very large. At the time of this report (four months after the parotids participated in the process), the parotids were reduced in size, but still considerably swollen. Syphilis is not considered as a factor in this case. The girl in every other way was seemingly healthy. M. B.

### CLINICAL ANATOMICAL AND EXPERIMENTAL RESEARCHES ON NODULAR LEPROSY OF THE OCULAR GLOBE AND ADNEXA.—CALDERARO, PALERMO (*La Clinica Oculistica,* Jan.-Feb., 1909).

Ocular leprosy must be considered a late complication of the cutaneous disease: in the nodular form the globe is invaded when the lids and ciliary border are strewn with macules. Published statistics show that in the first five years of the disease, the ocular adnexa are affected in 50 per cent. of cases; in the second five years, the adnexa are affected in 95 per cent. and the globe in 50 per cent. of all cases; in the second decade, it is difficult to find a patient without globe complications. Rarely the two eyes are invaded contemporaneously, but the rule is that the one eye is practically lost when the other becomes affected. Blindness in every case is the inevitable result of the ocular complications in from 10 to 30 years. The material for the researches was furnished by ten lepers with manifestations in both eyes, of whom one came to autopsy, two suffered enucleation, and the others were treated for leprosy of the sclero-corneal margin. All the patients were subjected to numerous bacteriological examinations: (a) of the superficial skin of the lids, of the lid margins, of the conjunctival mucosa, of the limbus, of the lacrimal secretion, of the nasal mucous membrane, and of the aqueous; (b) of the extremities of the fingers; (c) of the handerkchiefs used by the patients; (d) of the blood, repeated at intervals during and after febrile attacks. From the examinations the writer concluded that the superficial skin of the lids rarely contained the baccilli of leprosy; on 32 lids they were found only 7 times; the bacilli were always numerous and constant at the lid margins, whether there was loss of lashes or not; in the tears bacilli were found, and they appeared with a certain constancy in the conjunctival sac when the lid margins were affected: they were found in the subepithelial conjunctival tissue, even when they were not found superficially. Examination of the lacrimal apparatus was always negative. In the limbus many baccilli were regularly found corresponding to the episcleral nodes: when the limbus appeared normal, baccilli were frequently found. The aqueous contained a few baccilli in 2 of 14 eyes with leprosy of the limbus and cornea. Baccilli were always found in enormous quantities in the nasal mucosa and that of the palatine vault. They were sparsely present in the folds of the fingers and in the handkerchiefs; they were rarely found in the blood of lepers with ocular manifestations (2 out of 8 patients), one in a febrile attack, the other in apyrexia.

Monkeys, dogs and rabbits were used in four series of experiments, as follows: (a) Instillation of leprous tissue in the anterior chamber: (b) injection into the vitreous of an emulsion of tissue in sterile, physiological salt solution; (c) placing tissue under bulbar conjunctiva; (d) injection of an emulsion in the auricular vein. The material always contained numerous baccilli. Results were absolutely negative, not only in the reproduction of leprosy in various tissues (episcleral, corneal, uveal, vitreous, etc.), but also in the multiplication of baccilli and the production of leprous tissue at the sites of the inoculations.

*Anatomical researches.*—In the histological examination a series of accumulated cells was found in the subcutaneous connective tissue at an equal distance between muscle and epidermis, which formed an uninterrupted chain from the brow to the palpebral margin. With the high power one saw in these nodes an infiltration of small cells with large nuclei and scant protoplasm. On the edge of the lid the infiltration was observed exclusively in the deep part of each hair follicle in such manner that it surrounded the papilla and extended upward around the sheath. The sebaceous glands and the glands of Moll did not participate in the initial stage of the inflammation. The tissue invaded by the infection showed few pigmented granules which lay free or were within the cells. The sebaceous glands and the glands of Moll gradually atrophied. The sebaceous glands disappeared by atrophy from compression. The sweat glands were rapidly destroyed. The Meibomian glands were not directly invaded by the leprous infiltration, but underwent a considerable narrowing of their calibre.

R. H. J.

## GLAUCOMA.

Posterior Sclerotomy in Malignant Glaucoma.—Lindenmeyer, Otto, Frankfurt, M. (*Klinische Monatsblaetter fuer Augenheilkunde,* XLVII., 1909, II., p. 275), reports a case of absolute glaucoma and blindness of right eye and of glaucoma of left eye in the prodromal stage. After iridectomy in narcosis, the left eye was slightly irritated the next day, and the anterior chamber not restored. On the third day the cornea was opaque, tension increased, the eye painful, eserin and pilocarpin of no avail. As these symptoms became very violent, so that no red ophthalmoscopic reflex could be obtained, and vision was reduced to perception of motion of hand, visual field contracted, posterior sclerotomy, 3 mm. lng, 5 mm. from the limbus, was performed on the sixth day. The anterior chamber was at once restored. Uneventful recovery took place with the formation of a cystoid scar, but useful vision. By the reposition of the lens, in consequence of the posterior sclerotomy, the new efferent passages, established by the iridectomy, were made passable, so that the healing of the glaucomatous process, intended by the iridectomy, was realized.

L. recommends the operation as early as possible, i. e., as early as the iridectomy wound has become sufficiently firm to allow of restitution of the anterior chamber. He ascribes the unfavorable experiences of the older authors to too late operations. Posterior sclerotomy is best performed at the inferior temporal quadrant, about 10 mm. from the limbus. G. Z.

On the Visual Field in Glaucoma.—Ronne, H., Copenhagen (From the eyeclinic of Prof. J. Bjerrum in the University of Copenhagen, *Klinische Monatsblaetter fuer Augenheilkunde,* XLVII., 1909, I., p. 12). In the years from 1889 to 1892, Prof. Bjerrum published a new method of perimetry, especially for the detection of relative defects, which in a series of cases of glaucoma showed so far unknown characteristic peculiarities. He used small white objects at a large distance, usually 2 m. The visual angle can thus be made very small, and as the dimensions in the visual field are magnified in proportion to the distance from the patient, the detection of small and relative defects is much easier. The visual field was traced, on a large, black, non-reflecting shade, opposite the window, and reaching from the ceiling to the floor, with small white round ivory discs, fastened on long, black rods of metal. The center of the shade was the fixation point. A great number of characteristic charts illustrated the type of visual fields obtained with this method, and the percentage of its occurrence in glaucoma form a large material of clinical histories. R. calls especial attention to the importance of the comet-shaped defects, and paracental scotomas in form of arcs ascertained by Bjerrum's method for the differential diagnosis between atrophy and glaucoma. The value of the method is further corroborated by the fact that out of 87 visual fields, which in ordinary perimetry appeared normal, not less than 51 were proven by it as pathological. C. Z.

VIOLENT GLAUCOMA FROM TRAUMATIC DISLOCATION OF THE LENS CURED BY OPERATION.—MENDEL, FRITZ, Berlin (*Centralblatt fuer praktische Augenheilkunde,* 1909, p. 5). The left eye of a woman, aged 32, was struck by a cane with instantaneous blindness. At the examination, two days later, the lids showed intense ecchymoses, the eye was red and chemotic, the pupil was enlarged and did not react, its upper half was filled by the cataractous lens in such a way that two-thirds of the lens were in front of the pupillary plane, the upper third behind it in an oblique direction. The lens tremulous on movements of the eye; T. not increased, visual field normal. The fundus was not visible, but the patient counted fingers near by. Under eserin and bandage, vision rose within the next few days to counting fingers at 5 m. Suddenly headache and vomiting set in, and the patient saw only motion of hand. The eyeball was stone hard, very red, injected in form of the head of Medusa, i. e., showed all symptoms of intense glaucoma. As the headache became intolerable, the dislocated lens was extracted with Weber's loop in deep narcosis through section, with the broad lance-shaped knife (upon the advice of Prof. J. Hirschberg), of the inferior nasal limbus. There was slight loss of vitreous. After an hour, the patient was free from pain, which never returned. Three months later, V. with + 10 5/10. The optic nerve showed a large partial excavation, that of the other eye a large physiological excavation. V. F., normal. C. Z.

Increased Tension in Ocular Diseases of Infancy and Childhood.—Brown, Columbus, O. (*Ophthalmic Record,* Dec., 1908). It may not be possible to demonstrate increased intraocular pressure in the eye of a child, owing to the elasticity of the structure permitting stretching. Increased pressure causes distention of the globe in part or all of its diameters, hydropthalmos. In babies and young children, the early symptoms are lacrimation, photophobia and ocular congestion. Such cases should be watched until a diagnosis can be made, then iridectomy performed. If this operation is to prove of advantage, it should be while the disease is still incipient. M. B.

A Case of Bilateral Fulminating Glaucoma.—Randolph, Robt. L., Baltimore, Md. (*Ophthalmic Record,* Jan., 1909). A farmer, 63 years of age, was awakened by a severe pain in his eyes. The pain increased, and his family physician was called in and told him he had grip and prescribed accordingly. By evening his sight was affected and was practically gone by the next day, but the doctor told him it would return after he was well of his la grippe. He continued to suffer for ten days, when he consulted the author, who diagnosed absolute glaucoma. An iridectomy was performed on each eye, which relieved his suffering, but did not restore his vision. M. B.

On the Treatment of Simple Glaucoma.—Prof. J. Bjerrum, of Copenhagen (*L'Ophthalmologie Provinciale,* March, 1909). This writer begins by stating that iridectomy, as a remedy for this disease, has fallen into disrepute among a number of ophthalmologists. According to these the operation does not arrest the progress of the malady, and, sometimes even seems to accelerate its course. Others, however, deplore the fact that iridectomy has met with disfavor, and believe in operating early, considering it a waste of valuable time to resort to myotics. In studying the results of the operation, there is no doubt in Bjerrum's mind that, in proportion as it is performed early, in that same proportion the number of arrests augments in accordance with the number of operations. But, he avers, this does not prove that it is best to operate at the earliest in all cases of simple glaucoma. Myotics have the power, in many instances, to control the disease for years, or even indefinitely. But the fact that early iridectomy cures most of the cases, or gives better results than when applied to worse or later stages of the disease, does not make it certain that equally favorable results could not have been obtained with myotics. As regards the operation, the most successfully performed does not have the desired effect, and there are, besides, always certain risks. He holds that it is not right to operate until convinced that myotics can not ameliorate or stop the process. To determine whether or not myotics are influencing the progress, Bjerrum observes closely the visual fields, as taken at the normal perimeter distance, with a 1 to 2 centimeter white test object, and at a distance of two meter with a similar object, but whose diameter is only 6 mm. But he deems it of greater importance to resort frequently to the tonometer of Schiotz. This instrument, he claims, will record hypertension, often occurring periodically, that could not be made manifest by other objective methods, nor by subjective symptoms. He feels that, since the invention of this instrument, our handling of these cases now rests on a much surer base than when we depended upon mere palpation for our ideas of the tension. Myotics having failed, he proceeds to operate. He usually prefers anterior sclerotomy for simple glaucoma, which he makes somewhat after his own method. The knife is a small Graefe, narrow blade, but thick at the back, and near the point is double edged. He stands behind the patient's head for the right eye, and makes the sclerotomy downward; and at the left side, and with upward sclerotomy, for the left eye. In beginning the puncture the conjunctiva is displaced somewhat towards the limbus with the point of the knife before entering the sclera. As soon as the point appears in front of the iris at the angle of the chamber it is directed toward the lower circumference of the chamber (to the upper if left eye), keeping the blade close down to the iris, managing to catch the iris on the point of the knife just before making the counter-puncture. Thus the iris follows slightly the knife. The point of the knife emerges from the conjunctiva 3 to 6 mm. back of the limbus. Usually the aqueous escapes here, raising a bleb of conjunctiva. The knife is held still while the aqueous runs out, then slowly withdrawn, with a sawing movement, by which the sections are somewhat extended. At the site of the counter-puncture regularly appears a solution of continuity in the iris, which looks like an iridodialysis. The pupil, in consequence, is somewhat displaced toward the point of puncture, and becomes an oval, with its long axis parallel to the section. If the tension does not become normal in one week afterward, Bjerrum has recourse to compressive massage at the center of the cornea, through the lid as a supplementary measure. By pression massage over the cornea, the writer expects to get dilatation of the excretory channels around the rim of the anterior chamber, while by pression on the sclera the crystalline and iris are forced forward, and the tendency is to block and narrow said channels. By this massage, beginning 5 to 7 days after the sclerotomy, and practising it for only one minute daily for a week, Bjerrum has reduced the T to normal and seen it remain so as long as the case could be followed. The process is usually a little painful. The majority of Bjerrum's patients with simple glaucoma are treated by conservative means, i. e., myotics, and their vision conserved or bettered. The minority are operated by sclerotomy, followed by pression massage, as described. He adds, however, that in but few cases can he dispense with myotics, even after the operation. This form of sclerotomy is less of an operation than either iridectomy, the iridencleisis of Holth, or the sclerectomy of Lagrange. If it and the pression massage and the continued use of myotics do not give relief, he thinks one is justified in proceeding to operate by one of the other methods, for example, by that of Holth just alluded to, and which, when well executed, according to his experience, is a good anti-glaucomatous measure. C. H. B.

## INJURIES.

Injuries to the Eye and Adnexa.—Würdemann, H. V., Seattle, Wash. (*Northwest Medicine,* March, 1909, concluded from Feb. number). History and details to the smallest minutiae should be taken in all injuries, so as to guard our prognosis and the interests of the patient as well as the employer. Never give an opinion reflecting upon the first consultant or the employer, upon which damage suits can be based.

To bring into view abrasions that cannot be seen, use fluorescin and sod. bicarbonate sol. 2 per cent. of each, forming a green background if there is injury, however slight. No effect whatever is produced on intact corneal epithelium. Other methods for the detection of injuries that can be used are focal illumination, the ophthalmoscope, Würdemann's diaphanoscope, Roentgen rays, giant magnet and the sideroscope. The treatment of blows from blunt objects as a rule, are first absolute rest in bed, ice compressing every two hours, followed by one-half hour intervals by light bandages. Burns and scalds are best treated upon general surgical principles; aseptic cleansing of skin, anesthetic if necessary, peroxide of hydrogen, and papoid in glycerin 33 1-3 per cent., useful when powder is present in the skin. Carron oil, 2-3 per cent. and picric acid applications have their advantages. Foreign bodies in the eye may be removed by forceps or when magnetizable, the giant magnet is to be preferred after examining with X-ray. The majority of foreign bodies entering the eye are aseptic enough not to give rise to suppuration. Infection usually takes place by the patient's associate attempting to remove the foreign body. Applications of 50 per cent. argyrol to the eye is the author's preference to prevent infection.

The treatment of ocular traumatism is placed upon general surgical principles. Wounds of the sclera should be closed, atropin and dionin for the pain and to open the pupil, cold to prevent the infiltration of the tissues by blood. Gaping wounds of the cornea can be healed by drawing the conjunctiva over the cornea and stitching. Allow it to remain for four days, remove stitches, when the conjunctiva will retreat to its former location.

The author does not believe in any of the various substitutes for enucleation, preferring a suturing of the conjunctival pouch and fitting a reform eye, subsequently injecting a nearly solid parrafin to replace any orbital fat absorbed. Numerous cuts are shown of cases treated, with good results following injuries described. A series of 150 selected microscopic slides and 140 macroscopic specimens in glycerine jelly, of eyes removed for injuries, were shown on reading the address.

A. M. MacW.

Traumatic Injuries to the Eye.—Kipp, Chas. J., M. D. (*Journal of the Medical Society of New Jersey,* March, 1909). Case under observation for 28 years. First had several attacks iridocyclitis in left eye. Rheumatic etiology. Results of these attacks, iris atrophic and adherent to lens capsule, lens clear. Resisted all attempts to break up the adhesions. An attempted iridectomy upward in both eyes resulted in the anterior layers coming away, the pigmentary layer remaining on the capsule. Results of operation nil. Iridectomy O. D. Three years later with the same result. Fifteen years later did cataract extraction, small amount of vitreous escaped. Healing in 48 hours, but wound opened on the twelfth day and vitreous escaped, which was removed. Vision not improved by the removal of cataract. Several months later incised iris and capsule. Results, the vision now equals 6/1.

Case 2. Struck by fist right eye several days ago. Lids edeomatous upper and lower, ocular conjunctiva injected, cornea hazy lower half, anterior chamber nearly filled with blood; iris could not be seen. Light perception and projection good; treated with cold applications to lids, 1 per cent. atropine and six leeches. Case not seen for two months, when he returned with an atropine conjunctivitis; circumcorneal injection, ulceration of lower half cornea, anterior chamber normal in lower half, shallow in upper half, aqueous clear, pupil dilated and lens could be seen dislocated upwards and forwards, vitreous full of floating opacities. Fundus details could not be made out. Zinc, 1/4 per cent., now used and boric acid sol. At the end of month the atropine conjunctivitis had disappeared and ulcer healed. Operation on lens refused. Case seen again six years later with left eye blind. Injured eye now enlarged, sclerotic white and staphylomatous at limbus (upper), hazy cornea, anterior chamber shallow, iris atrophic, and a pupillary membrane. Tension was reduced, light perception, but not projection. Regarded case hopeless and the patient died some little time afterward. The question is whether it was sympathetic iridochorioiditis or of some other origin.

Case 3. Struck in the left eye by carpet tack and practically blind. Right eye lost 15 years previously. The left eye odeomatous lids and conjunctiva, hazy cornea, central, ragged wound with infiltrated edges, anterior chamber absent, iris against the cornea, lens capsule torn and lens matter in the pupil. Movements of hand recognized a short distance away. Patient put to bed; cold compresses, and conjunctival sac washed with boric acid solution and atropine sol. 1 per cent. used every two hours; two days later corneal wound healed, anterior chamber normal and dilated pupil. Had much pain, for which six leeches applied to temple, dionin powder used, but with no result on the irido-cyclitis. Tension so great at end of 11 days, cataract extracted under ether anesthesia. Result, wound healed kindly, and four weeks from the beginning of the injury, cataract had entirely absorbed; vision equalled 5/xii. In December, 1908, vision again poor, due to lens capsule. The capsule was incised, and vision then equalled as before 5/xii.

Case 4. Struck right eye by piece of wood the day before. The left eye had enucleated for similar injury 15 years ago. O. D. vision 5/xxxvi, conjunctiva injected and odeonatous. There was a small lacerated wound at the inner lower margin of the cornea; anterior chamber shallow and well filled with blood; tension somewhat reduced; treated with cold applications. Inflammation subsided in one month, so that the discolored iris could be seen, pupil of medium size, not influenced by atropine instillations and dionin, although no adhesions. The lens was seen to be tremulous, and torn below from its suspensory ligament in and out, but still transparent; fundus not seen, due to vitreous opacities; vision improved by January 10, 1909, sufficient for house work. Lens became opaque 8 months later and an extraction of lens in capsule was performed, resulting in 20/lxx vision with correction. A. M. MacW.

A Case of Unilateral Exophthalmus Cured by Removal of a Piece of a Knife, 6 Cm. Long, from the Orbit.—Junius, Coeln (*Zeitschrift fuer Augenheilkunde*, 1909, p. 138). Six years ago a man, aged 27, received a stab on the left eye. The wound healed, but often broke open in the eye, which gradually became protruded, was frequently inflamed and discharged pus. The ophthalmoscope showed a few old pigment foci in the lower temporal quadrant of the chorioid. For the last six weeks the inflammation was especially obstinate. The outer two-thirds of the lower lid was everted and fixated by a fistulous scar at the lower orbital margin, from which pus could be pressed out.

After laying this bare, a piece of a knife, 6.1 cm. by 1.4 cm., the upper two-thirds of which projected into the orbit, was found firmly impacted in the orbital wall, from which it was extracted after chiselling a wedge out of the bone. The affection healed permanently with normal vision. An examination with Roentgen rays would, of course, have cleared the condition at once. C. Z.

A CASE OF AVULSION OF THE EYEBALL BY AN INSANE PERSON.—LUNDSGAARD, K., Copenhagen (*Klinische Monatsblaetter fuer Augenheilkunde*, 1909, XLVII, I, p. 131). Although no eye witness was present, all circumstances pointed to the assumption, that one insane woman had within two minutes, as they were not longer together, torn out the eyes of another insane woman. One eyeball was lying on the floor, the other was hanging on the internal rectus. The optic nerves were severed at about 4 and 5 mm. from the eyeballs. L. gives the measurement of the stumps of the ocular muscles left in connection with the globe. According to Axenfeld, literature contains no authentic instance of one person having torn out the eye of another. C. Z.

A CASE OF MINIMAL CHIP OF IRON IN THE LENS, WITH REMARKS ON THE DIAGNOSIS OF INTRAOCULAR PIECES OF IRON.—VOSSIUS, A. (From the eyeclinic in the University of Giessen, *Deutsche Medicinische Wochenschrift*, 1909, No. 1, p. 21), reports two cases to show the diagnostic and practical value of siderotic discoloration of the iris and yellowish dots on the anterior surface of the lens. If siderosis of the iris is lacking in a cataract with yellow dots on the anterior surface of the lens, we are justified to infer the presence of a piece of iron in the lens, whereas siderosis of iris and cataract with yellow dots on the surface of the lens point to the seat of iron in the vitreous or the retina. If the foreign body remains in the eye, the siderosis of the iris may disappear after several years, but the iris may still give iron reaction, as observed by E. von Hippel. C. Z.

TRAUMATIC IMPLANTATION OF AN EYELASH, CIRCUMSCRIBED PURULENT IRITIS; RECOVERY AFTER EXTRACTION OF LASH AND IRIDECTOMY.—HIRSCHBERG, J., Berlin (*Centralblatt fuer praktische Augenheilkunde*, 1909, p. 2). The porcelain stopper of an exploding beer bottle struck the left eye of a man, aged 31. There was a small penetrating wound at the lower nasal quadrant of the corneoscleral junction, coagulated blood in the anterior chamber, the pupil covered with exudations. The eyeball was very soft and painful. The continuous pain, and irritation of the other eye, suggested the presence of a foreign body in the eye. Eleven days after the injury, H. detected with the loupe, on oblique illumination, a very fine eyelash implanted in the iris at the medial pupillary margin lying over the medial portion of the pupil, with the point at the nasal upper portion of the cornea. The iris, at this place, showed a circumscribed slight swelling, with newformed fine blood-vessels.

In deep narcosis, the medial limbus of the cornea was incised with a lance-shaped knife, and the eyelash grasped with a forceps. The hair, however, was not extracted with the forceps, but lay in the wound from which it was removed. The diseased portion of the iris was excised. The pain ceased at once, and after two weeks the eye was without irritation. H. mentions another case of purulent iritis caused by a penetrating eyelash, which he published in 1892. In both cases the speedy removal of the cilia saved the eyes and prevented sympathetic ophthalmia. C. Z.

A CYSTIC FORMATION BY THE PARS CILIARIS RETINAE FOLLOWING A PERFORATING WOUND IN THE CILIARY REGION.—CHANCE, BURTON, Philadelphia (*Arch. Ophthal.*, March, 1909, xxxviii, 115), describes a penetrating wound in the ciliary region caused by the explosion of a lubricating glass on a locomotive. Ten days after injury the edges of the wound were still ununited, though the external inflammatory signs had subsided. Sympathetic irritation appeared at this time and the exciting eye was enucleated. No particles of glass were found in the eye. Microscopical examination showed the choroid atrophic and the retina firmly attached with marked proliferation of the pigment epithelium, cystic changes, and thickening of the nerve-fibre layer. The vitreous was degenerated and the lens cataracterous. Between the lips of the wound was a csyt-like structure, the internal layer of which was formed by the pars ciliaris retinae. The external layer of the cyst was composed of a fine reticular substance and was evidently formed by a modification of the vitreous.

The author calls attention to the time that the wound remained unhealed, while the external inflammatory signs subsided, and to the early date at which the sound eye showed signs of sympathetic irritation. He also called attention to the cyst formation, degeneration of the vitreous, absence of glass, and the rapid destruction of chorioid and retina.

W. R. M.

## INSTRUMENTS AND METHODS.

The Technique of Localizing Foreign Bodies in the Eye and Orbit by the X-Rays.—Carman, R. D., St. Louis, Mo. (*St. Louis Medical Review*, St. Louis, Mo., March, 1909).

The method employed in the cases presented is that of Sweet of Philadelphia, modified by Borser of Columbus, Ohio. and used in conjunction with the Weeks-Dixon chart. Kelly-Koett Manufacturing Co.'s device with receding spring trigger, localizing clamp for head, tunnel and plate carrier for the plate. This enables us to make two exposures upon one plate without disturbing the patient's head or the localizer. The patient is required to lie upon the regular compression diaphram table, the head resting on the localizing centre, with the affected eye next to the plate, clamped and steadied with sand bags to prevent motion. The visual axis of the eye should be parallel to the plane of the plate and the eye fixed upon some object, usually at about 15 ft., which renders the visual axis approximately parallel to the plate. The indicator consists of a ball and cone that are 15 mm. apart, the cone being at the temporal side of the head. The trigger is set and the ball placed in the centre of the cornea, so as to exactly indicate the visual axis of the eyeball. This is sighted by means of a similar devise to that which is used on a rifle. The patient's eyes are both closed and the ball is pushed into the lid about the lid's thickness, and the trigger released, when the ball drops back 10 mm. The patient is then instructed to open the eyes again and look at the candle. and if everything is in proper position, he is told to continue looking at the candle until the exposures are made. In this position the first exposure is made with the ball perpendicular to the plate indicator and parallel to the plane of the indicator: this giving us the first negatives. The tube is then shifted toward the patient's feet 4 or 5 inches and tilted slightly; the plate is then changed and, without moving the ball and cone or anything else, another exposure is made, thus securing the second negative. The measurements are made as follows: Upon the first negative a line is drawn in the axis on the rod and ball, which are here super-posed, and the visual axis of the eye is thus established. A line is also drawn perpendicular to this and through the centre of the foreign body's shadow, with a mm. rule is measured the distance of millimeters laid upon the front view of the chart, either above or below the point representing the position of the cone. Upon the second negative lines are drawn through the axis of the ball and the axis of the cornea, and perpendicular to these through the foreign body. Then with the mm. rule the distance of the foreign body above or below the prolonged axis is measured; these distances are also recorded upon the front view on the chart at the proper points. The intersection of this line with that made by the first negative will show the location of the foreign body viewed from the front. Upon the first negative the distance of the foreign body from the anterior surface of the cornea is determined by measuring from the ball along its axis to the perpendicular through the foreign body and deducting 10 mm. for the rebound of the ball when the trigger was released. Upon the chart a line is then drawn from the point of intersection of the cornea, into the horizontal section, and the distance from the front of the cornea measured and indicated. In a like manner, a line is drawn from the point of intersection in the front view, parallel to the chart line going through the centre of the cornea, into the side view, and the distance measured back from the centre of the cornea. Extreme accuracy in making the lines and measurements upon the negative and charts should be sought for. A draughtsman's pen, with red ink being used for greater contrast. A. M. MacW.

TONOMETRY.—SCHIOTZ, H., Christiana (*Archiv fuer Augenheilkunde,* 62, p. 317), corrects his former assertion, that the curves, obtained by measurements on the open eye, i. e., directly communicating with the manometer, may be applied to the intact living eye. The curves of the intact eye are much lower than those of the open eye.

Then follows a description of his tonometer, which may be procured from N. Jacobsen's elektriske Vaerksted, Pilestraedet 25, Christiana. After using it daily for two years, S. found it practical and reliable, and the fingers very unreliable for more exact determination of ocular tension.

He also tested with it the influence of eserin, pilocarpin, morphin, atropin, cocain on intraocular tension and gives the results in tabular form. The decrease of tension by eserin and pilocarpin has been ascribed to the miosis, but S. found it also in an eye with congenital aniridia, and after iridectomy, where miosis could play no part. Morphine increases temporarily the tension and apparently has no value in the treatment of glaucoma. Atropin seems to have no special effect on intraocular tension of normal eyes, but in eyes predisposed to, or with higher tension, a drop of atropin will almost always increase the tension. The interference with the outflow in glaucoma cannot always be attributed to obstruction of Fontana's spaces, except in cases with normal or deep anterior chamber, e. g., in buphthalmus or serous iritis. If, however, the anterior chamber is narrow, as it occurs most frequently, the impediment must be behind the lens and the stasis in the vitreous propelled the lens and iris. Cocain does not influence intraocular pressure, except in predisposed eyes by its mydriatic action.

In five normal eyes different times of the day did not change intraocular pressure. In pathologic eyes, especially in glaucoma, it is remarkable how rapidly and considerably tension may change, e. g., in prodromal attacks it may very soon reach 50 to 60 Hg. Detachment of the retina is not always combined with hypotony, except in old cases and after iridocyclitis. Increased tension is generally considered as a differential diagnostic sign of detachment of the retina with tumor from that without tumor. This is true in large tumors. In three typical cases of detachment by small tumors in which this symptom would have been of value, S. found remarkably low pressure. In measurements of a glaucomatous eye with very high tension before enucleation, S. found 122 mm. Hg. after enucleation; 72 mm. in an eye with normal tension, 19 mm. before, O. after enucleation. Out of a few postmortem measurements, one, taken immediately after death, indicated an intraocular tension of zero. C. Z.

ON THE ACTION OF THE INTERIOR POLE MAGNET.—MELLINGER, CARL., Basel (*Zeitschrift fuer Augenheilkunde*, XXI, 1909, p. 204). This is an answer to the paper of Prof. O. Schirmer on practical experience with the interior pole magnet, which was reviewed in the last number of Ophthalmology. To Schirmer's assertion that the lines of magnetic force always retain the same direction, perpendicular to the plane of the ring, thus preventing e. g. a traction from above downwards on a piece of iron lodged in the lower portion of the globe, M. answers the following: The principle for the extraction of intraocular pieces of iron by electromagnetism lies in the properties of two magnetic bodies to approach one another. In order to impart this quality to the piece of iron and the extraction rod as much as possible, both must be highly magnetized. This is achieved by the electric current in the solenoid, not by the influence of one magnetic iron upon the other. The attraction depends not upon the direction of the so-called lines of force of these two magnets, but upon the masses and distance to which it is directly proportional. The possibility of extraction depends upon the magnetic saturation of the foreign body, which takes place in the solenoid as soon as the head of the patient is brought into the ring.

The second objection of Schirmer was the confinement of the maximal action of the interior pole magnet to the center of the ring. M. considers this as a decided advantage as it allows of ready variation of its intensity such as cannot be attained in any other utilization of electromagnetic power. This variation can be increased by the different sizes of the rods.

A modification of the interior pole magnet by Mr. Klingelfuss which allows of operating on the patient in recumbent position was demonstrated in 1908 at the eyeclinic in the University of Basel. C. Z.

A Handy Pupillometer for the Consultation Room.—Von Pflugk, Dr., Dresden (*Klinische Monatsblaetter fuer Augenheilkunde,* XLVII, I, p. 189). It consists of a colorless plate of celluloid, 0.5 mm. thick, with a millimeter scale in form of an isosceles triangle. The sides are applied as tangents to the pupil, which is illuminated by a concave mirror, and the numbers at the middle points of the bases, indicate the widths in millimeters. The apparatus may be procured from P. Doerffel, Berlin, N. W. 7, for 50c. C. Z.

A New Method of Holding the Lens for Oblique Illumination.—Goebel, Carl, Trier (*Klinische Monatsblaetter fuer Augenheilkunde,* 1909, XLVII, I, p. 186). For the illumination of the cornea in removal of foreign bodies, etc., G. considers the lens holders, so far in use, not sufficiently practical and expedient. His instrument consists of a ring, for the fourth finger of the right hand, bearing a lens of 20 D. on a short hinge joint. C. Z.

THE OPHTHALMODIAPHANOSCOPE AND ITS APPLICATION IN THE VARIOUS BRANCHES OF MEDICINE.—HERTZELL, CARL, Berlin (*Berliner Klinische Wochenschrift*, 1908, No. 47, p. 2097). Since his first publication on the ophthalmodiaphanoscope (reviewed in Ophth.), H. improved it considerably and describes this in detail. He emphasizes again, that trans-illumination of the fundus is an independent method of examination. Its results are not to be paralleled with those obtained by the ophthalmoscope, but are to be principally distinguished from these. Its object is to test the fundus for differences of transparency. Opaque objects on the surface of the fundus appear perfectly distinct. Those behind the eyeball are noticeable by shadows proportional to their size. On account of its easy technic it may, with limitations, substitute the ophthalmoscope image, but it cannot vie with its detailed delineation. Thus it may be employed by beginners in ophthalmoscopy as a preliminary exercise. The instrument can also be used for transillumination of the eye from in front and the sides, and, on account of its much greater intensity of light, proves of greater advantage than the apparatuses so far in use.

Finally H. speaks of its usefulness in rhinology, cystoscopy, gynecology, etc. C. Z.

ANOTHER DRESSING FOR OPERATED EYES.—MITCHELL, S., Hornell, N. Y. (*Ophthalmic Record*, Feb., 1909). The dressing is in the form of a shield cut from a sheet of thin celluloid board, which can be purchased of a dealer in artist's supplies. The shield is cut after a pattern illustrated in the article, and is held in position over the eye by strips of adhesive plaster.
M. B.

A NEW INSTRUMENT FOR THE OPERATION OF SECONDARY CATARACT.—GOEBEL, CARL, Trier (*Zeitschrift fuer Augenheilkunde*, XXI, 1909, p. 212). In operations for secondary cataract three chief points must be avoided as much as possible, viz., larger openings of the anterior chamber, escape of aqueous, traction on the ciliary body, deep penetration into, and injury of the, vitreous. In order to attain this better than with the instruments so far in use, G. devised a discission fork, which after being introduced behind the cataractous membrane, establishes a firm layer of resistance. The prongs of the instrument consist of two parallel discission needles from 1 to 2 mm. distant from one another, forming with the handle an angle of from 110 to 160 degrees. It is inserted subconjunctivally from the nasal limbus and at the margin of the iris or eventually through the iris into the secondary cataract, advanced under this more or less over the opposite margin of the iris, and lifted forwards toward Knapp's needle knife, which, also subconjunctivally, has been introduced from the temporal limbus. With slow and sawing movements the membrane is cut between the prongs. If necessary, a vertical incision may be added. G. does not doubt that the thickest iritic membranes can thus easily and safely be severed without exerting any dangerous traction on the ciliary body. C. Z.

## IRIS.

Cyst of the Iris.—Weyer, J. S., Kansas City (*Ophthalmic Record,* February, 1909). A man of 36 years presented a translucent gray tumor of the iris of left eye. It was situated at the temporal end of the horizontal meridian, and was 7 mm. high by 4 mm. wide. No history of traumatism nor ocular disease. The only symptom complained of was "burning." The case has been under observation 3 months, and the cyst has increased slightly in size. Operative interference was declined.
M. B.

## LACRIMAL APPARATUS.

Nasal Causes and Treatment of Diseases of the Lacrimal Apparatus and the Conjunctiva.—Meyer, Arthur, Berlin (*Zeitschrift fuer Augenheilkunde,* XXI., 1909, p. 124). During the last four years, M. examined rhinologically several hundred cases of diseases of the lacrimal apparatus and the conjunctiva and reports, with utilization of literature, his observations from the rhinological standpoint.

The first group comprises the negative cases, amounting to from about 10 to 15 per cent.

For the second group the mechanical imperiment of the tear-passage by obstructions in the nasal meatus are considered, e. g., through changes of the shape of the lower turbinated body, so that it lies close to the lateral wall of the meatus. This is one of the most frequent causes of epiphora, existing for years. It may be spontaneous, or the turbinated body is displaced outwards by cristae, spinae and deviations of the septum. Other causes are diffuse hypertrophic rhinitis, circumscribed papillary or bullous hypertrophies of the lower turbinated body, synechiae between this and the nasal floor. More than half of the cases of epiphora are due to these mechanical nasal obstructions, and the treatment of the nasal affection gives a good prognosis for the cure of epiphora, which generally existed for years.

Group III: Inflammatory and purulent processes in the nose may also mechanically interfere with lacrimal conduction by causing hypertrophic rhinitis or by producing dacryocystitis by continuity or infection, with subsequent blepharo-conjunctivitis, blepharitis ciliaris, phyctenulae, or corneal ulcers. Ozena plays one of the most important parts by the formation of adherent crusts, and propagation of the inflammatory, atrophic, process to the lacrimal duct. Phlegmons develop most frequently in this kind of chronic atrophic dacryocystitis. Adenoids act by entertaining a chronic inflammation of the whole mucous membrane of the nose, or they may be the seat of circumscribed suppuration, which may infect the lacrimal duct and conjunctiva. Polyps are not a very frequent cause of lacrimal affections, and empyemas of the accessory sinus are not as influential in dacryocystitis as in infections of the orbit, optic nerve, etc., among them, however, those of the ethmoidal and maxillary sinus, most frequently. Of other circumscribed suppurations of the nose, tertiary lues, sequestra, foreign bodies and rhinoliths must be considered as etiological factors.

Under the fourth group specific infections processes are discussed, viz., tuberculosis of the lacrimal duct, mostly due to lupus of the mucous membrane of the nose, and rhinoscleroma.

The second part is devoted to the treatment. The chief requisite for a rational treatment of the lacrimal canal, conjunctiva and lids is a careful examination of the nose and nasopharnyx. For correcting the deformations of the lower turbinated body, M. recommends his method of infracting and bending the lower turbinated body inwards by an angle of 40 degrees. He does not approve of resecting a portion of the healthy lower turbinated body, as this may be detrimental to the nasal function, while circumscribed hyperplasias must be removed, diffuse hypertrophies treated with galvanocautery or medicines. Then the treatment with permanent tubes is discussed, probing from below, dacryocystorrhinostomy of Toti and intranasal resection of the lacrymal duct, according to

Passow and Oknew, which must be considered only as substitutes of extirpation of the tear sac. C. Z.

HYPOMYCETES OF THE TEAR DUCT.—LOEWENSTEIN, A. (From the eyeclinic of Prof. A. Elschnig, in the German University of Prague, *Kinische Monatsblaetter fuer Augenheilkunde,* 1909, XLVII, I, p. 141). A woman, aged 35, was treated for some time, of pressure and burning in the left eye, and was treated with sulphate of zinc. As the feeling of pressure did not subside she was examined by Prof. Elschnig, who found the region of the left upper canaliculus red and swollen, and by pressure with a glass rod emptied a yellowish greenish pulp from the upper tear point. After slitting, and scraping the epithelium of the canaliculus with a sharp spoon, it healed promptly and the conjunctival trouble had disappeared the next day.

The concrement consisted of streptothrix. While literature contains over 50 cases of streptothrix in the lower canaliculus, its occurrence in the upper canaliculus has been reported only in four cases.

The differential diagnosis from leptothrix was established by the ramifications, the growth of the cultures on agar, and, although an uncertain sign, the lacking reaction to iodine; from actinomycocis, by the missing globular bodies and club-shaped swellings, and the slight animal pathogenicity.

Another case of Elschnig, published in 1895, as actinomycosis, is described, which after reexamination of the specimen was found to be due to streptothrix. Occasionally it may be very difficult to recognize the nature of such fungus concrements, since the fungi die after remaining in the canaliculus for some time and become disintegrated. L.'s observations make it probable that the affection is rather frequent and generally ends into spontaneous recovery with absorption of the detritus.

Of the occurrence of trichomycetes in the lacrimal sac, only one case, of Mitvalsky, is known. Therefore, the following case of trichomycetes concrement in the inflamed tear sac is reported, which probably caused the infection. The lacrimal region was bulging, and upon pressure a thin yellowish secretion was emptied. As irrigation did not succeed, the sac was extirpated, which, however, could be done only partially, the walls being diseased and very brittle. The hyphens were examined microscopically and are described in detail with good illustrations. C. Z.

## LIDS.

An Unusual Case of Congenital Ptosis.—Cridland, Bernard, Stafford (*Ophthalmoscope,* Jan., 1909). A girl of about 4 years of age presented a condition of non-hereditary congenital ptosis with defects of mobility of the eyes. The pupillary reaction to light is poor, and there is apparently none to accommodation. The vision of the right eye is moderate, and that of the left eye is good. There is an incomplete lacrimal fistula present on the right side, situated just to the inner side and below the inner canthus. M. B.

Blepharochalasis, Report of a Case of this Trophoneurosis, Involving also the Upper Lid.—Laffer, W. B., Cleveland (*Cleveland Medical Journal,* March, 1909). This condition was first described by Fuchs in 1896. It involves the skin of the upper eyelids, which becomes thin and inelastic, with the veins dilated, and has a crinkled appearance. The changes in the skin are most pronounced between the eyebrow and the beginning of the tarsus. There is no true ptosis, but simply a sagging down of the skin over the eyelashes. The histologic examinations of the skin made by Fuchs and Fehr show a dilation of the superficial veins, marked atrophy of the skin and the papillae are much flattened or have disappeared. Fuchs advises excision of an elliptical piece of the integument and suture of the edges of the wound. This has been done successfully by Von Graefe, Fuchs and Hirschberg, the patient presenting a perfectly normal appearance after the operation. The case which the writer carefully describes is that of a Hebrew boy of 12, classical in every way except in the involvement of the lip. M. D. S.

## MATERIA MEDICA AND THERAPEUTICS.

Novel Therapeutic Measures for Herpes Zoster Ophthalmicus.—v. Arlt, Vienna (*Wochensch. f. Therap. u. Hyg. d. Aug.*, Jan. 28, 1909). In a case of herpes zoster ophthalmicus, involving the entire distribution of first branch of the trigeminus in a man 87 years of age, v. Arlt painted the affected parts with iodol and Alzol cream and covered the face with a mask of red celluloid, with the greatest relief from pain and without a resulting scar. W. Z.

ETHYLMORPHIODID, A NEW DIONIN PREPARATION.—SYLLA, BRUNO, Bremen (*Wochensch. f. Therap. u. Hyg. d. Aug.,* Jan. 7, 1909). Impressed by the favorable results obtained from the employment of iodoform and dionin, concluded that dionin would be more efficacious if the chlorin element was replaced by iodin, and has had Merck make such a compound. It is less soluble than dionin (4 per cent.), and in such strengths is but little active. The author employs the powder, which he finds less painful and more active than dionin powder. W. Z.

GUMMA OF THE RETINA CURED WITH MERGAL.—ROSENBAUCH, KRAKAU (*Wochensch. f. Therap. u. Hyg. d. Aug.,* Feb. 18, 1909). The patient was a man 24 years of age, who had had a primary syphilitic lesion 3 years previously. In the right eye there was an extensive exudate in the retina, with sharply circumscribed margins. V., fingers at 4 mm. He was given mergal in increasing doses internally and unguent. cinereum in the temporal region, with the result that the retinal lesion cleared and vision and the field were retained as at the first visit. W. Z.

THE TREATMENT OF ULCUS CORNEAE SERPENS WITH PYOCYANASE.—HEILBORN, Breslau, (*Wochensch. f. Therap. u. Hyg. des Aug.,* April 1, 1909). In a case of serpiginous ulcer of the cornea, in which the process had steadily increased, despite energetic medical local treatment, the progress was arrested and rapid healing brought about by the instillation of pyocyanase, the active principle of which is the formation of a bacterolytic enzyme which acts destructively not only upon cultures of the bacillus pyocyaneus, but upon many pathogenic microorganisms. The pneumococcus was destroyed in 3 minutes. W. Z.

ARSENOPHENYLGLYZIN IN EXTERNAL DISEASES OF THE EYE. —GRUETER, W. (From the eyeclinic of Prof. P. Roemer in the University of Greifswald, *Deutsche Medicinische Wochenscrift,* 1909, No. 10, p. 444). Within the last half year quite a number of eye patients were treated with 2 per cent. and 5 per cent. arsenophenylglyzin ointment, with the following results: It is an unirritative, useful remedy in treatment of eczema. Its chief advantage is its intense absorbing action in eczematic pannus and fascicular keratitis. Also in trachomatous pannus it stimulated absorption, while it had no influence upon the trachomatous conjunctiva. C. Z.

ON THE INFLUENCE OF ADRENALIN ON INTRAOCULAR TENSION. RUPERT, J. KIEW (*Zeitschrift fuer Augenheilkunde,* XXI, 1909, pp. 97 and 24), shows in a very good synopsis of the incident literature, that exact scientific investigations on the influence of adrenalin on intraocular pressure were exclusively made on eyes of animals, while the observations made on the human eye were simply ascertained by the uncertain and subjective method of palpation, and consequently led to contradicting results. In his 34 examinations, 13 on normal eyes, 21 on eyes with increased tension, R. used adrenalin of Parke, Davis & Co., 1:1000, and the tonometer of Maklakow. The results are arranged in tabular form and discussed in detail, with the following conclusions: Instillations of from 4 to 5 drops adrenalin, or subconjunctival injections of a still smaller quantity, cause distinct changes of intraocular tension, viz., at first decrease, then increase, and finally secondary depression. These fluctuations of tension were observed on normal and glaucomatous eyes. While in normal eyes the amplitude of the oscillation is small and within the limits of experimental errors, the undulations in glaucoma frequently are very considerable and are beyond the range of the limits of errors of the tonometer. The action of adrenalin in normal eyes lasts several hours, in glaucomatous generally a few days. In a series of glaucoma patients the effect of adrenalin is distinctively depressing, in another it raises the tension so that it may evoke a glaumatous insult. Repeated instillations of adrenalin (one drop several times a day) do not materially influence the normal pressure, while in eyes with higher tension an increase may be noticed, which seems to be caused by the last instillation. The fluctuations of tension, following the combined instillation of eserin and adrenalin, are to be considered as the resultants of two different, simultaneously acting forces. At the moment at which adrenalin differs from eserin in its action on the intraocular tension, an increase or decrease of tension may follow, according to the predominance of the stronger acting drug. In patients suffering from, or predisposed to glaucoma, the application of adrenalin, even with eserin, must be guarded. The fluctuations of intraocular tension after adrenalin are best explained from its action on the vascular system of the eye. C. Z.

WHAT IS THE MAXIMUM DOSE OF IODIDE OF POTASH, ESPECIALLY IN SPECIFIC IRITIS OR ELSEWHERE IN LOCAL SYPHILITIC MANIFESTATIONS?—HOBBS, ARTHUR G., Atlanta (*Gaillard's Southern Medicine,* February, 1909), says that in a fulminating, virulent, gummatous condition, often on a mucous membrane, especially on the iris, the daily dose of iodide of potash should be measured only by results. He increases the dose daily until in some cases one ounce a day is taken. Eight to sixteen ounces of sweet milk are given with each large dose. He reports a case of fulminating specific iritis in a man aged 45, in which he started with 80 grains of potassium iodide on the first day increasing to one ounce on the fifteenth day with only slight symptoms of iodism. The dose was rapidly decreased during the next 15 days. During the month the patient took 8 ounces of the iodide, and in the next two months 2 ounces more. His vision increased from almost nil to 5/cc. and he gained 10 pounds in weight; however, protiodide, atropine and nitrate of silver were used. The writer has on record about 40 cases in which he used the iodide in large doses. M. D. S.

THE NEWER SILVER SALTS -AS COMPARED WITH SILVER NITRATE IN THE TREAMENT OF OPHTHALMIA NEONATORUM. —CHENEY, FREDERICK E., Boston (*Boston Med. and Surg. Jour.,* March 4, 1909). The writer is an advocate of the use of argyrol and protargol in place of silver nitrate in the treatment of ophthalmia neonatorum. He quotes Hasket Derby in this connection and gives the experience of O. F. Wadsworth with the newer silver salts at the Mass. Charitable Eye and Ear Infirmary, describing comparative tests with these and with silver nitrate. Corneal involvement was only one-third as frequent, and the duration of the disease only two-thirds as long when the former remedies were used than when silver nitrate was employed. He does not agree with Derby in the latter's belief that the good results obtained with argyrol and protargol were due rather to the systematic and thorough cleansing of the eyes than to the remedies employed.

Considering the question from a bacteriological standpoint, he gives North's experiments which showed that a 5 per cent. protargol solution and a 20 and 30 per cent. argyrol solution are as effective in destroying gonococci as a 1 or 2 per cent. solution of nitrate of silver.

He cites Sydney Stephenson's statistics, which show superiority of argyrol and protargol in the prevention of ophthalmia neonatorum, pointing out that this observer found the results with 1 per cent. solution of silver nitrate better than when a 2 per cent. solution was used. He explains this as follows: If silver nitrate causes a catarrhal inflammation, the conditions are much more favorable for the development of ophthalmia neonatorum, if any gonococci remain undestroyed, than they would be if a catarrhal inflammation were not present. If silver nitrate is to be used, therefore, a weaker, less irritating solution than a 2 per cent. is, as these statistics suggest, to be preferred.

Finally, he calls attention to the greater ease of application of the newer silver salts in the treatment of ophthalmia neonatorum: In applying nitrate of silver, it is necessary to evert the upper lids, and this is not easy of accomplishment in a newborn babe. A man not experienced in this manipulation stands a fair chance of abrading the cornea, and infection and ulceration will be the probable result. There is also the danger of corneal injury from a too free use of this remedy. These two possibilities, he thinks, contraindicate the use of nitrate of silver in this affection, except by men of experience in the treatment of diseases of the eye. In using argyrol and protargol, on the other hand, no special experience is required, it being unnecessary to evert the lids, since these remedies can be dropped into the eye and used freely. C. H. M.

LOCAL ANAESTHETICS RECOMMENDED AS SUBSTITUTES FOR COCAINE.—Report of the Therapeutic Committee of the British Medical Association (*Brit. Med. Jour.*, March 27, 1909). The substances which have been investigated are: Stovaine, novocain, tropacocaine, beta-eucaine, alypin, beta-eucaine lactate, nirvanine, holocaine hydrochloride, acoine, orthoform (new), anaesthesine.

The points to which special attention has been paid are those laid down by Professor Braun as essential in estimating a local anaesthetic action. They are: (1) A lower degree to toxicity than cocaine in proportion to its local anaesthetic power. (2) Sufficient solubility in water. The solutions should be stable, that is, they should be kept without deterioration and be capable of sterilization by boiling. (3) Absence of any sign of irritation. There should be no injury to the tissues; the local anaesthetic should be easily absorbed without causing any after-effects, such as hyperaemia, inflammation, infiltrations, or necroses. (4) Compatibility with adrenalin, (5) Rapid penetration of the mucous membrane, and suitability for medullary anaesthesia. The only exception made to these postulates is that dealing with absorption; it is not obvious that easy absorption is desirable, if absorbed slowly, the drug produces more prolonged action; for this reason adrenalin is injected with these substances, producing local vaso-constriction and thus giving the anaesthetic a longer time for action. If a drug can be obtained which fulfills the above conditions, it can be safely said that it will supersede cocaine.

A drug which is not soluble in water to the extent of forming a two per cent. solution has been regarded as unworthy of competing with cocaine. This throws out acoine, holocaine, anaesthesine, orthoform (new) and betaeucaine. Cocaine, stovaine, novocaine, tropacocaine, betaeucaine, lactate, alypin and nirvanine are freely soluble in water; their solutions are stable, and as a two per cent. solution they will keep for a short time without deterioration. Cocaine cannot be boiled, as decomposition occurs, and the drug loses its activity and is gradually destroyed. Stovaine, novocaine, betaeucaine lactate, tropacocaine, alypin, nirvanine can be sterilized at 115 degrees C. if necessary, undergo no change, and the drug is as active after as before sterilization.

Regarding the local anaesthetic properties, it was found that stovaine has a more powerful anaesthetic action, weight for weight, than any of the other local anaesthetics. Alypin, betaeucaine lactate, novocaine, and tropacocaine have anesthetic properties about equal to cocaine. Nirvanine as a local anaesthetic is inferior to cocaine.

Concerning toxicity, as determined by the smallest dose which will kill frogs, mice and rabbits, it was found that alypin has anaesthetic powers equal to cocaine, but a higher toxicity, and so does not comply with the conditions enunciated by Braun. Nirvanine has not the anaesthetic power of cocaine, and it is only slightly less toxic. As, however, we have found four drugs equal to or stronger than cocaine in anaesthetic power, and considerably less toxic than nirvanine, no further experiments with this drug were deemed necessary. From this it will be seen that only four drugs, namely, stovaine, novocain, tropococaine and betaeucaine lactate, have complied with the first two conditions. With these four drugs further experiments were performed to discover how they fulfil the other conditions laid down for the "perfect local anaesthetic."

Next the irritant action on the tissues was investigated, and it was found that the irritant action of stovaine, betaeucaine lactate and tropacocaine is far greater than that of cocaine; novocain is the only drug which is superior to cocaine in this respect.

All the local anaesthetics are compatible with adrenalin if the solutions are fresh and kept only for a short time. After a day or two the adrenalin decomposes unless it is kept in stoppered opaque bottles.

The following conclusions are given: In determining which of these four drugs is the most suitable substitute for cocaine, it is necessary to compare them with one another.

If novocain and tropacocaine be first compared, their toxicity and anaesthetic properties are, roughly, equal; but the irritant action of tropacocaine is far greater than that of novocain; in other respects their actions are similar, therefore novocain is a more suitable drug than tropacocaine.

On comparing novocain with betaeucaine lactate, it is seen that while the anaesthetic value is roughly about equal, the toxicity of betaeucaine lactate is slightly less than that of novocain, but the irritant action of betaeucaine lactate is far greater than that of novocain. It appears, then, that while betaeucaine lactate has only a slighter degree of toxicity to recommend it in preference to cocaine, its irritant action far and away overshadows any such slight advantage, and novocain is recognized as undoubtedly the better drug of the two.

Finally, it only remains to compare novocain with stovaine. The former drug is less toxic and much less irritant; indeed, its specific action on nerve fibres is so great that it has practically no destructive effect on the other tissues; stovaine is more toxic and considerably more irritant.

The one definite advantage which stovaine possesses over all the other local anaesthetics is its greater injurious action on nerve fibres, as shown by anaesthesia. Nevertheless, the specific action of stovaine on nerve fibres is less than that of novocain, since novocain destroys other tissues besides nerve fibres. If stovaine and novocain be given in doses so that their anaesthetic action is the same, both the irritant and toxic effect of the former drug, even in the smaller dose in which it is administered, are greater than the relatively larger doses of the latter.

The conclusion is reached, therefore, that of the drugs which have been investigated, novocain is most satisfactory for general use. Its anaesthetic action is equal to that of cocaine, and its toxicity and general destructive power on the tissues are very much less. C. H. M.

ATROPIN—ITS USE AND LIMITATIONS IN THE CORRECTION OF HETEROPHORIA.—MURRAY, GILBERT D., Scranton, Pa. (*Ann. Ophthal.*, April, 1909). Since 1898 the author has estimated the refraction 2,000 times under atropine. Three hundred times he found heterophoria present. In these cases he continued the use of atropine three times daily until the heterophoria disappeared. Glasses were then prescribed if the error of refraction warranted it. He reports in detail a large number of cases manifesting errors of muscle balance of varying degrees, some small and some large. Esophoria and hyperphoria disappeared as readily as did esophoria under this treatment. He reports the cases in which an improvement was temporary and those in which there was no improvement. The latter were mostly in young neurotic women. M. B.

THE TREATMENT OF SEPTIC CONDITIONS OF THE EYE BY MEANS OF VACCINES.—GRIMSDALE, HAROLD, London (*Ophthalmoscope*, Jan., 1909). Two cases are reported where an emulsion of staphylococci was given by the mouth which resulted in immediate improvement of each case and speedy resolution. One was a case of septic iritis following six days after cataract extraction. The other was a case of an obscure intraocular inflammation. M. B.

ELECTRICITY AS A HYPOTONIZING AGENT IN OPHTHALMOLOGY.—GONZALEZ, DR. JOSE DE JESUS, Leon, Mexico (*Anales de Oftalmolgía*, April, 1908).

While treating a young girl affected by internal ophthalmoplegia, by means of continuous currents, the author noted a decrease of tension in the eye, subject to the current, in comparison with the other eye. By experimenting on healthy eyes, he has proven that the phenomenon of hypotension is constant. The author adopts the following technique: He places on the eyelids an electrode adaptable to the eye connected with the negative pole, the positive on the back of the head, increasing it until it reaches 30 or 40 milliamperes, the application lasting 15 minutes and decreasing the intensity little by little to 0, so as to avoid the vertigo produced when the current crosses the encephalus. The tension notably decreases in comparison with the other eye, and the hypotony so disappears that in 24 hours the tension is again equal in both eyes; but if the application is repeated daily, one succeeds in diminishing considerably the tension and in maintaining the hypotension for several days. The author successfully treated a case of serous iritis and another of acute glaucoma. In the first the hypertension was very marked and, fearing to apply atropine, he had recourse to continuous currents, obtaining the hypertension in two days, and being then able to apply atropine. In the glaucoma case, the vision was O and the tension plus T 3, after four sessions of 15 minutes each day, the attack yielded without eserine.

The decrease in tension is doubtless due to the fact that the electric current promotes the excretion of the ocular liquids, both by its vaso-dilatation action, and by changes in the osmotic pressure.

The transcendental practical fact is: Diminution of ocular tension by continuous currents applied through the eye.

M. U. T.

## MISCELLANEOUS.

An Appeal for the Sake of Man and Medicine.—Gould, George M., Ithaca, N. Y. (*American Medicine*, March, 1909). The author says that at least 27 per cent. of European school children have lateral curvature of the spine and the great majority of our young educated people have this disease. He believes this condition is wrecking millions of lives, that it has given rise to osteopathy and other cults. He says it is due to certain axes of astigmatism which compel a constant tilting of the head to the side to see plainly, or in a greater number of cases to a habitually morbid writing posture. To prevent this disease, correct the ametropia, and place the writing paper twelve or fourteen inches from the eye, opposite the right arm and shoulder of the squarely-placed and erect-bodied pupil, and on a desk slanted at an angle of 30 or more degrees. He describes a method of diagnosing lateral curvature and gives sample set of rules which he gives patients under the age of 20, while the disease is still functional, for its correction by means of physical exercises, posture, etc. He says there is probably not an emmetropic pair of eyes in the world, and if there were one such pair, the "accommodation" of the eye is unprepared for and incapable of the tasks of early and middle life. He believes the chief inflammatory and surgical diseases of the eye (after babyhood), such as cataract, heterophoria, amblyopia, iritis, etc., are the consequence of ametropia, or eyestrain, and enumerates many diseases resulting from eyestrain and backstrain.

THE EYE AND ITS DISEASES, IN RELATION TO THE WORK OF THE GENERAL PRACTITIONER.—HURRELL, M. LOUISE, Rochester, N. Y. (*Woman's Medical Journal,* January, 1909), emphasizes the diagnostic importance of eye symptoms in various systemic diseases, among which are swelling of the eyelids in general anascarca, chronic nephritis, anemia, arsenic poisoning, cerebal thrombosis, erysipelas, coryza, hay fever, iodism, measles and smallpox, and often the presence of blepharitis in a tubercular diathesis. Unilateral dilatation and bilateral dilatation and contraction of the pupil are discussed, and the frequent use of the ophthalmoscope by the practitioner is urged. For vesicular eczema of the lids a drying powder of starch, zinc oxide and camphor, or an ointment of equal parts zinc oxide and vaseline and 20 grains of calomel, or aristol ointment are recommended, with constitutional tonic treatment. Suggestions as to diagnosis and treatment of many inflammations of the eye are given, and points of differentiation between iritis and glaucoma are named. M. D. S.

OPHTHALMIC AND AURAL LABORATORY DIAGNOSIS.— CAMPBELL, DON M., Detroit (*Ophthalmic Record,* Dec., 1908). Laboratory diagnosis has done, among other things, these for ophthalmology and otology:

1. Supplied one positive and several suggestive means of combatting conjunctival inflammation. This is capable, the writer thinks, of great extension, and good practical results will come.

2. It has given us a method of combatting infections by means of certain vaccines and serums. Their action, however, must ever remain subsidiary to the securing of good surgical drainage. They will, however, in certain instances, be found valuable when surgery has accomplished all it can, and still Nature's reparative powers seem inadequate to the task of repairing the pathologic and surgical damage.

3. A definite method of diagnosticating autointoxication originating in the alimentary canal.

4. A definite method of diagnosticating tubercular lesions.

5. A definite means of diagnosticating syphilis.

6. A definite means of accurately gauging Nature's reparative powers in any given case. M. B.

PRACTICAL EYE TREATMENT FOR THE GENERAL PRACTITIONER.—N. W. PRICE (*The Canada Lancet*, May, 1909).

The paper is a protest on the meagre amount of ophthalmology of a practical nature which is supplied the medical students during their university course. One university was mentioned in the United States in which no student had heard a lecture on refraction, much less taught to refract. All had seen a number of operations, but none had done any of the very simplest ones. As a result of the ignorance on the part of the general practitioner, numbers of people are consulting opticians, who practice and live on the neglected cases of refraction, as well as on other eye disorders which they do not hesitate to treat.

General practitioners on entering practice should understand refraction until they are reasonably sure of their results. They should be able to recognize and treat the commoner forms of conjunctivitis, keratitis and iritis. They should be able to detect a corneal opacity from a cataract and be able to distinguish a case of glaucoma, as well as have a working knowledge of the ophthalmoscope. They should send to the specialist all cases of complicated refraction, as well as all requiring operative treatment, except such simple cases as hordeola and chalazion. Were the general practitioner able to treat such cases, they would retain the confidence of the public, and as a result people would discontinue going directly to the opticians, many of whom practice ophthalmology on the side. The specialist would also benefit in having cases sent to him direct, before unfortunate complications, either from neglect or ignorance, have set in.

A number of the commoner diseases of the eye are given and their diagnostic differentiation very briefly explained. Some practical points are laid down by way of treatment; but this consists on the whole as a summary of what one would expect to find in one of the smaller handbooks on ophthalmology.

F. T.

Novel Improvised Prothesis.—Fenton, R. A., Portland, Oregon (*Ophthalmic Record,* March, 1909). A man of 69 years had one eye removed in 1892. He was found to be wearing a prothesis made of the half of a prune pit, shaved smooth by a pocket knife on the edges. The cornea was represented by a pearl button being set in the front of the prune pit.

M. B.

## MUSCLES.

Some Facts Concerning Family Exophoria.—Reber, Wendell, Philadelphia (*Ophthalmic Record,* Dec., 1908). Believing that there is a relationship between the shape of the head and the orbital development and that the latter contributes to faulty extrinsic ocular muscle action, the author has undertaken the measurement of a number of heads. A series of heads were measured at random, while another series was made up from families known to have so-called family headaches. There were 40 cases in the second series. The heads of the men were measured by a hatter's conformer, and the heads of the women with calipers. These forty people formed the majority of seven families. One was orthophoric, five esophoric and thirty-four were exophoric. Of the thirty-four exophorics, twenty-one submitted to head measurements, and of this latter number eighteen were long skulled (dolicocephalic), and three were medium skulled (mescephalic). The author believes if this relation obtained in a large series of cases that it would indicate that dolicocephalus predisposes to exophoria. M. B.

The Non-operative Treatment of Squint.—Lukens, Charles, Toledo (*Ohio State Medical Journal,* February 15, 1909), says that the evolution of the non-operative treatment of squint has been one of the brilliant achievements of ophthalmology. He emphasizes that the time to begin the treatment of any case of concomitant squint is when it begins. He discusses only concomitant squint, and quotes several authorities. After securing certain important data in each case, the author determines the refraction in the usual manner if the patient is one year old or more. He says that: "In addition to eliminating the over-convergence tendency, refraction gives two clear retinal images, which are capable of fusion under favorable circumstances." He cites a case of squint in a child of seven having marked ametropia, the eyes remaining balanced so long as the frames containing the lenses prescribed were straight. He mentions measures that may be used to develop the visual acuity of the squinting eye as the occlusion pad or atropin for the fixing eye. The method with some sort of stereoscope, as Worth's amblyoscope, is described. After briefly considering alternating and divergent squint, he discusses the length of time non-operative treatment should be kept up, giving the rules and results of different observers. He believes that "when all physicians appreciate the importance of immediate interference in every case of 'crosseyes,' the percentage of cures will approximate 75 or 80 per cent. without operation." M. D. S.

OPERATIVE TREATMENT OF SQUINT.—CLARK, C. F., Columbus, Ohio (*Ohio State Medical Journal*, Feb., 1909).

A simple case of alternating squint of moderate degree will often yield excellent results if carefully operated upon by one of the usual methods.

In what he terms "obstinate squint" you must have recourse to several operations and necessarily the full confidence of the patient.

His experience leads him to make the following general statements: (1) In moderate degrees of squint in eyes, both of which have approximately normal vision, one subconjunctival tenotomy by Steven's method in the usually deviating eye, will sometimes be sufficient, but generally a better result is obtained by dividing the tenotomy between the two eyes. (2) In high degree of deviation, especially when exceeding five to six millimeters, an advancement in combination with a guarded tenotomy is greatly to be preferred to a tenotomy alone. (3) Under no circumstances does he recommend a free tenotomy alone, liable to be followed years afterward by a wandering eye. (4) In cases of considerable degrees of esotropia with amblyopia and especially if the glass correcting the hypermetropia has only been recently worn, it is best to leave a moderate degree of uncorrected convergence, the lenses correcting the balance. In exotropia, slightly over-correct. (5) If vertical deviation, correct before operating on the lateral recti.

His preference is for advancement by a tuck; the plan that has yielded him excellent results is as follows:

A vertical conjunctival incision ten or twelve millimeters long is made anterior to line of insertion of the tendon. Separate the conjunctiva from underlying tissues forward to almost the cornea and backward for a distance corresponding to the length of the desired advancement, not disturbing the capsule or the tendon. Insert strabismus hook beneath the tendon, raise it and make incisions as long as the advancement is to be at the upper and lower border; turn the milled head in opposite direction enough so as to cause the proper amount of tucking. If an assistant is not at hand, the handle of this hook may be detached and sutures inserted; three sutures are used, two lateral and one central. The instrument is not withdrawn. Stitches are black and removed in two weeks. Close conjunctival wound with fine silk and remove in a few days.,

The author believes that we owe a debt of gratitude to Dr. Geo. Stevens for what he has taught us. A. M. MacW.

The Disadvantages of Tenotomy and the Advantages of Muscular Advancement in the Various Forms of Strabismus.—Sauvineau (*Annales d'Oculistique,* February, 1909).

This is an extract from the chapter on strabismus in the French Encyclopedia of Ophthalmology. Sauvineau, in a long article with rather frequent repetitions, opposes the practice of tenotomy under any conditions, maintaining that, even if the immediate result is satisfactory, the permanent one cannot be controlled.

He concludes that simple advancement in one eye, with or without section of the tendon, will often suffice in case of insufficiency and a moderate degree of strabismus will disappear with a slight advancement in both eyes, while advancement with resection of the tendon should be reserved for the higher degrees.

He does not think it possible to determine within a millimeter just how far to advance the muscle or exactly how much of the tendon to resect, as some authors have claimed. It is not the operator who determines the exact effect, but, when binocular vision is maintained, the patient himself. G. C. H.

SQUINT: A CONTRIBUTION TO ITS ETIOLOGY AND OPERATIVE TREATMENT UNDER CONTROL OF THE STEREOSCOPE.—BJERKE, Linkoping (*Graefe's Arch.*, LXIX, H. 3, Jan. 5, 1909), believes that in the vast majority of cases there is required for the production of squint a special innervation which is absolutely independent of the refraction of the eye. This also explains why as a fact either inward or outward squint may occur with any form of refraction, and why not all hyperopes squint inwards, and all myopes, outwards. The refraction has only a favoring influence upon strabismus—this is the only truth in Donder's theory.

Under cocaine anaesthesia the tendon of both the internus and the externus are laid bare; a suture is then passed through the tendon of each muscle and fastened at the sclerocorneal margin. The tendons are then severed and the eyes brought apparently parallel and one knot tied in the suture. The patient then looks into the stereoscope and sees if the two half pictures are together. If not, while the patient still looks into the instrument, the knot is tightened with a pair of pincers until the double pictures fall together. The result is proven with the Maddox rod, and if not perfect the knot is unfastened and the direction of the eye modified until the line cuts the light.

W. Z.

UNILATERAL CONTRACTION OF THE ELEVATOR OF THE UPPER LID.—POLACK (*Annales d'Oculistique*, February, 1909).

In the case reported of a woman forty-two years of age without other ocular disturbance, the left upper lid was retracted so as to notably enlarge the palpebral fissure. The condition had existed for two months.

As the Stellwag and Graefe signs were present, the patient had been rapidly growing thin for several months, and the pulse was frequent. The author thinks it probable that the levator spasm was a symptom of the early stage of exophthalmic goitre.

G. C. H.

AN ANALYSIS OF THE INVOLUNTARY EYE MOVEMENTS IN A CASE OF CONGENITAL, BINOCULAR, LATERAL NYSTAGMUS, FROM PHOTOGRAPHIC RECORDS.—DODGE, RAYMOND, and DIEFENDORF, ALLEN ROSS (*Arch. Ophthal.*, January, 1909, xxxviii, 1), give the results of a photographic record of the eye movements in a case of congenital lateral nystagmus. The records were made by photographing the reflection of a luminous point from the cornea, on a slowly falling photographic plate, by means of an enlarging camera. Each deviation of the record from a straight line represented a lateral movement of the eye; the angle and extent of the deviation depending upon the velocity of the eye movement. The authors state that each nystagmic wave seems to consist of three phases: (1) A period of fixation with more or less relatively slow fixation drifts. (2) A more rapid temporal movement, which is interrupted by (3) A rapid corrective movement of Dodge's first type.

The authors consider one of the results of their records as a refutation of von Arlt's hypothesis with regard to the optical motive for nystagmus. Their results showed that "the main nystagmic deviation could not have been motived by the effort to move the object of interest to a fresh portion of the retina, since the rapid movement of the eyes altogether precludes effective vision during that part of the nystagmic wave when the nystagmic deviation is greatest." W. R. M.

UNILATERAL SPASMODIC RETRACTION OF THE UPPER EYELID DATING FROM INFANCY.—MORAX (*Annales d'Oculistique,* February, 1909).

Morax reports the case of a man forty-seven years of age in which this condition was congenital and occasioned no inconvenience.

There were no general symptoms of Basedow's disease, and the author thinks that there is not enough precise knowledge of the affection for a useful discussion of its pathogeny.

G. C. H.

## NERVOUS SYSTEM.

OPHTHALMOPLEGIA INTERNA IN CHILDHOOD.—BOLDT, ALTONA (From observations of Prof. R. Deutschmann, *Beitrage zur Augenheilkunde,* Heft 71, 1909, p. 16). So far ophthalmoplegia interna in childhood was considered very rare, and B. could find in recent literature only two observations, one by Gelpke and one by Cruchandeau, which are quoted. B. reports the clinical histories of five cases, aged 19, 29, 12 and 11 years, in which the affection dated back to childhood. In all a cerebral affection was assumed, viz., of the nuclei of the sphincter pupillae and the ciliary muscle. This was most likely due to syphilitic endarteritis in cases 1, 2 and 3, which showed the symptoms of hereditary syphilis, although B. could not anywhere find confirming anatomo-pathological descriptions. Case 4 may have been due to latent tuberculosis, while in case 5 a nuclear affection, either from hemorrhages, caused by convulsions, was surmised, or from anemia and disturbance of nutrition, or both.

In case 4 the paralysis of the sphincter and muscle of accommodation became stationary after instillation of one drop of a ½ per cent. solution of atropin. Probably a latent lesion of the nucleus from the constitutional affection, was rendered manifest by the action of atropin. This observation seems to give occasion to warn against exaggerated use of atropin, e. g., in parenchymatous keratitis.

Miotics have only a transient effect and therefore have no therapeutic value. The good results obtained by Cruchandeau in his case of hereditary syphilis, with subcutaneous injections of benzoate of mercury, suggest energetic antisyphilitic treatment in these cases, as it has been successfully used in ophthalmoplegia of adults, due to acquired syphilis. C. Z.

PARALYSIS OF THE CERVICAL SYMPATHETIC NERVE ACCOMPANYING NEURITIS OF THE BRACHIAL PLEXUS.—PROF. FUCHS, Vienna (*L'Ophtalmologie Provinciale*, March, 1909). This paralysis manifests itself in the eye by syndrome of Horner, to-wit: Ptosis, contraction of the pupil and, sometimes, slight exophthalmos. The skin of the face on the affected side has a temperature lower than that of the opposite side, it is paler, and its transpiration is diminished or abolished. Divers causes give rise to the affection, and, for the most part are obscure. Mention is made in the literature of palsies of the third and sixth nerves occurring during the course of acute polyneuritis, especially of alcoholic origin, but no reference is made to such symptoms on the part of the sympathetic. Mlle. Klumpke alone has called attention to this affection in paralysis of the inferior roots of the brachial plexus—causing atrophic paralysis of the thumb and little finger, of the interosseous muscles, and sensuory disturbances in the region of the annular and median nerves, now known as *Klumpke's disease.* With this introduction, Prof. Fuchs proceeds to report two cases. In the first instance he, himself, was the victim. While otherwise in good health. he was taken with pains in the right shoulder, which he took for ordinary rheumatism. But the pains rapidly increased till at the end of two days they became almost intolerable. They radiated clear to the finger-tips, and were combined with hyperesthesia of the skin of the arm, and great sensitiveness at the *point of Erb,* i. e., just behind the inferior attachment of the sterno-mastoid, and at the inner sulcus of the biceps tendon. Muscular force in the arm was diminished for several months. Two days after the onset one of his confreres noticed contraction of the right pupil, without ptosis. This may have been present earlier. After a few days the pupils again became equal. The neuritic pains required 6 to 8 weeks to completely subside. "Whatever the cause," remarks Prof. Fuchs, "I hope my readers will believe my affirmation that it was not alcoholic." The other instance relates to a woman, 44 years of age, of good general health, and with nothing notable in personal or family history. In March, 1907, she fell ill with what was said to be influenza. She was not much concerned as to the malady till the left arm began to pain dreadfully, and she grew so dizzy, with every change of bodily position, that she was afraid to move. No diplopia. At the end of 3 weeks she came to the clinic, complaining of pain in raising the arm, or in putting it behind her. Pain on pressure at the *point of Erb* and internal bicipital sulcus. Looking quickly to the right or left produced nystagmus, more pronounced in the right eye, which, like its cogener, is found in position of abduction. Diagnosis, acute neuritis of brachial plexus, probably consecutive to influenza, and accompanied by neuritis of the cervical sympathetic and of the vestibular nerve. That the cochlear nerve was not involved was evinced by absence of any deafness or tinnitus. Nystagmus, as a symptom in acute alcoholic neuritis, has been obsered by several authors. The coincidence of brachial neuritis with an affection of the fibres of the sympathetic is thus explained by the anatomy: The nerve filaments leave the spinal cord with the roots of the brachial plexus, by the sixth, seventh and eighth intervertebral openings, going to the inferior cervical ganglion and nerve. They ascend with this nerve to the carotidian plexus, passing from there to the ciliary ganglion and to the eye. It is in that portion where their course is common with the roots of the brachial plexus that inflammation of this organ is transmitted to the sympathetic filaments. C. H. B.

## OPERATIONS.

The Question of Disinfection of the Hands for Eye Operations.—Wehrlin, J. (*Archiv. fuer Augenheilkunde,* 62, p. 303), reports his investigations by which he showed that, after the usual disinfection of hands and arms before eye operations, the subsequent infection of the instruments, and thus of the eye, is not eliminated, as long as we operate with moist hands and arms and moist instruments. H. found experimentally that after natural or artificial infection of the arms and hands, in spite of all disinfection, infectious germs run down from the moist arms and hands along the instrument very rapidly and for a long time. The advantage that the ophthalmic surgeon touches the wound only with instruments, is with certainty not warranted unless hands and arms after disinfection are dried with sterile clothes and dry sterile instruments are used. C. Z.

Permanent Drainage of the Eyeball by Transplantation of Bloodvessels into the Globe.—Halben, R., Griefswald (*Archiv. fuer Augenheilkunde,* 62, p. 392). The drainage of the ventricles of the brain by transplantation of bloodvessels, devised by Payr, suggested to H. the same method for ophthalmo-therapeutic purposes. He describes in this preliminary communication his experiments, which were chiefly intended for the treatment of glaucoma. A communication between vitreous and subconjunctival space was established by sewing a living artery of the same species, which was introduced a few mm. deep into the vitreous, into a subconjunctival triangular excision of the sclerotic. A second method was to connect the anterior chamber with the subconjunctival space by introducing a bloodvessel through the enlarged scleral section of cyclodialysis. H. thinks that if permanent implantation with patent lumen can be achieved it must be possible to lower the intraocular pressure to a degree which must be between the preoperative and the subconjunctival pressure, and that this will open a wide therapeutic field. C. Z.

A Case of Iridectomy, on Account of Closure of the Pupil from Blennorrhoea Neonatorum, seen again after 33 Years.—Hirschberg, J. (*Centralblatt fuer praktische Augenheilkunde,* 1909, p. 73). In 1876 iridectomy was performed on the left eye of a boy, aged 16 weeks, who had a large central leucoma adherens with closure of pupil after blennorrhea neonatorum. The next day the ophthalmoscope revealed a circumscribed opacity of the lens at its anterior pole. The mother was instructed to let the child exercise his left eye by tying the right, and to bring him again. This she did after nine years, when the boy showed horizontal nystagmus, V. =fingers at 6 feet. The opacity of the cornea was less, that of the lens the same.

The patient returned 33 years after the operation. Half a year previously he observed a dark spot in the center of a movable net. V. was reduced to counting fingers at 0.75 h., leucoma and opacity of lens were unaltered, coloboma transparent, the border of the lens visible, optic nerve and tension normal, small, light foci were at the periphery of both eyes.

The deterioration of V. of the left, diverging eye must be attributed to non-use. The case shows the necessity of methodic exercises of the affected eye. Iridectomy is only the beginning of the cure in such cases. C. Z.

On Discission.—Bernheimer, St., Innsbruck (*Klinische Monatsblaetter fuer Augenheilkunde,* 1909, XLVII, I, p. 113), thinks that in discission not only the traction on the surrounding tissues, but also the destruction of the anterior surface of the vitreous, more or less associated with it, must be avoided. Therefore, the capsule must not be torn, but cut. This, he believes, can be better achieved with his new instrument, which consists of the point of a von Graefe's knife, whose edge is from 7 to 9 mm. long, and gradually ends into a thin, blunt shaft. It is introduced from the limbus, parallel to the iris, into the thinnest portion of the secondary cataract, which must be previously ascertained with ophthalmoscope and loupe.

The most important preventive against incarceration of vitreous in the corneal wound is the preservation of the anterior chamber. B. also uses this knife for cutting the anterior capsule of transparent lenses, or partial, especially zonular, cataracts, with subsequent linear extraction from on the fifth or eighth day, and considers this method preferable to primary linear extraction in young persons, as recommended by Sattler, Hess and others. G. Z.

Five More Cases of Implantation of Fat After Enucleation.—Velez, Daniel, *Mexico (Third Annual Meeting of the Mexican Ophthalmological Society and Anales de Oftalmologia,* May, 1908).

The author has presented before the Mexican Ophthalmological Society, in two papers, 10 cases of implantation of fat, either in the cavity of an old enucleation, or after exenteration of the eyeball. Dr. Fernando Lopez has presented before the same Society, 6 cases after enucleation and 12 after exenteration.

The author now presents 5 new cases after enucleation, which, in his opinion, are the cases that give the best results, as the fat is best grafted in Tenon's capsule. In 4 cases the prostethic result was very satisfactory after the cicatrization (that is, immediate) takes place; in the other, the fat is infected and melts, and the atrophied shreds must be extracted.

He thinks that in certain cases the fat may be reabsorbed, and he presents before the Society an anatomical specimen consisting of an eye in which exenteration had been performed and the implantation of fat. Two years afterwards, the eye had to be enucleated on account of pain. It was found void of fat.

But the author has seen several cases where, even after 6 years, the socket was still full and nourished.

He recommends the following precautions:

1st. Always to take the quantity of fat necessary for filling the cavity from the gluteal region, taking care, when suturing that the fatty ball be not too much compressed. 2nd. To sew with silk; catgut is quickly reabsorbed. 3rd. To perform the operation with rigorous asepsis and not to implant too large a volume of fat, so as to avoid strangulation. J. de J. G.

The Present Status of Mules' Operation and of Delayed Implantation of a Gold Ball.—Fox, L. Webster, Philadelphia (*Ophthalmoscope*, Jan., 1909). The author performed Mules' operation in 1893 and has been using the operation in all suitable cases ever since. He finds its cosmetic results exceed those of any other operations. He has performed the operation 385 times and has not had sympathetic inflammation follow the operation in any instance. In one case the operation was performed in the presence of sympathetic inflammation and the procedure was as effectual as enucleation. The delayed implantation is the author's own operation, and has proven most satisfactory as a substitute for Mules' operation, where enucleation had to be performed. His present method of performing this operation is to make the incision through the orbital tissues in the superior nasal angle. Through this opening a pocket is made in the tissues lying underneath the center of the orbit. Into this pocket a gold ball is inserted, which is from 12 to 14 mm. in diameter. The orbital opening is not sutured, but is pressed together by a conformer which also serves to hold the gold ball in position in the center of the orbit. M. B.

INNOVATIONS IN OPERATIVE TREATMENT OF PERSISTENT GLAUCOMAS. A STUDY OF THE SUBSTITUTES FOR IRIDECTOMY.—FRIDENBERG, PERCY, New York (*Ophthalmic Record*, Dec., 1908). This is a very comprehensive review of all the operations which have been proposed as substitutes for iridectomy in the cure of glaucoma. The article does not lend itself well to review. M. B.

THE TREATMENT OF RECURRENT PTERYGIUM.—GIFFORD, H., Omaha, Nebr. (*Ophthalmic Record*, Jan., 1909). Five cases are reported, some of which had been considered hopeless, where large Thiersch flaps were used to replace the scar tissue. The results were finally satisfactory in all cases, but some cases demanded a great deal of perseverance on the part of the patient and the operator, as several operations were required to put the eye in a state satisfactory to all concerned.

M. B.

REPLACEMENT OF INCARCERATION OF THE IRIS BY TRACTION FROM WITHIN THE ANTERIOR CHAMBER.—JAMESON, P. CHALMERS, Brooklyn (*Arch. Ophthal.*, Jan., 1909, xxxviii, 17), reports a case of prolapsed iris in which he removed the prolapse by the method described by Dr. John Dunn in the *Arch. Ophthal.*, Sept., 1907. Replacement was done by passing a blunt iris hook into the anterior chamber, through a corneal incision, and making traction on the incarcerated iris.

The writer considers this method much superior to external manipulation. W. R. M.

A METHOD OF PERFORMING NASAL TARSORRHOPHY.—GOERING, Meiszen (*Wochensch. f. Therap. u. Hyg. des Aug.*, Feb. 25, 1909). The procedure consists in splitting both upper and lower canaliculi, thus securing four shallow wounds, two above and two below. The anterior lips of the wounds are then broadened from ½ to 1 mm., from the punctum to the canthus. The upper and lower lids are then united by from 8 to 4 silk sutures, which must not be too fine and must not shave the edge too close. The surfaces must unite evenly. The operation is useful in senile ectropion and may be combined when necessary with Snellen's suture, or with the Kuhnt-Szymonowski method. W. Z.

ON THE IMPLANTATION OF THE EYE OF A RABBIT IN TENON'S CAPSULE, TO GIVE BETTER SUPPORT TO THE PROTHESIS.—PROF. WICHERKIEWICZ, Krakau (*L'Ophthalmologie Provinciale,* March, 1909). This writer admits that an excellent support is afforded for the artificial eye after evisceration, but seeing that so many eyes *must* be enucleated, he thinks it desirable, for cosmetic purposes, as well as for the health of the lids and socket, to obtain a larger stump than is left after even the best form of enucleation. Especially as regards children, who cannot wear a protesis, and those individuals whose orbital fat is not abundant. He gives a brief history of the efforts of Mules, Adams, Frost-Lang, Webster Fox, Rollet, et al. Then of Chibret, who first tried putting a real eye (that of a pig) into Tenon's capsule; then of Rohmer's experiments with rabbits' eyes, beginning by implanting them in the peritoneal cavities of animals; then of Lagrange's more successful ones with eyes of the same animal. In view of the divergence of opinion of certain of his eminent confreres as to the implantation of the eye of the rabbit, W. resolved to attempt personal verification of the value of the method. At first he executed the operation after the manner of Lagrange, and latterly used a modification of the same, in such a way as to eliminate some of the difficulties. He preferred to operate with chloroform. If any serious obstacle to narcosis existed, he anesthetized locally by injections of cocaine and adrenalin (Schleich's). First step, circumcision of the cornea. Second step, picking up each rectus tendon with a sharp hook, passing a catgut suture through capsule, then tendon in each instance, severing the tendon from the globe, and giving the sutures to an aid to hold. Third step, division of the obliques and of the opticus. The enucleation accomplished, he irrigated the tenonian cavity with cold sterilized physiologic salt solution. Next a freshly enucleated rabbit's eye was placed in the cavity, *cornea backward,* i. e., toward the optic nerve. The sutures bringing together the four cut ends of the opposite muscles were tied, and, lastly, the conjunctiva was closed over all by means of a purse-string suture of silk. Binocular bandage, left on for three days, when first dressing, and, on the fifth day, removal of the conjunctival suture. After that only the operated eye was bandaged for a few days. When the operation was under local anesthesia, wet, cold dressings were applied to counteract the considerable reaction. Seeing that the operation is merely for the furnishing of a suitable stump, the idea of Lagrange, to reverse the position of the implanted eye, gave better results than that of his predecessors, because there was less danger from the defective nutrition of its cornea. W. and his assistants made thus 35 implantations, 16 in men, 6 in women and 15 in children. In 24 instances there was no serious complication. In some of the others the threads cut out, necessitating rethreading of the muscles set free. In one there was copious hemorrhage beneath the conjunctiva, and in two marked exophthalmos due to deeper hemorrhage. Recovery was without complication, or normal, in 22 cases. In 11 there was considerable edema of the conjunctiva. In one case recurrence of a malignant tumor, which meant sacrifice of the new eye and exenteration of the orbit. Local anesthesia was employed in only three cases. In all cases the implanted eye lost volume up to one-third or one-half of its original size, the atrophy being greatest in the older subjects, in whom it apparently disappeared completely. It was not thought prudent to fit the prothesis till all traces of irritation had passed. This in the cases operated under chloroform was generally after at least one month, and in those made under local, or infiltration anesthesia, still later. W. is not convinced that such cases are free from the danger of sympathetic ophthalmia. He first thought that this rather laborious operation could be recommended for the following cases: 1st. Where appearance is of prime importance. 2nd. Where enucleation is urgent and one must, at any cost, obtain authority to operate. 3rd. Where one cannot expect an artificial eye to be worn at an early day, as, for example, in a young child. After having completed his articles, as here abstracted, W. had the good judgment and fairness to wait another year in order to better appreciate the ulterior results, ere putting it in print. He then adds that while he has nothing further to say relative to operative methods, etc., yet, to be conscientious towards the science he represents, he can only publish that which is in accord with his most profound convictions. Hence, he is constrained to avow that his enthusiasm for the operation has calmed since a more extended observation of the cases in question. He finds that it is only in children that one can expect the transplanted eye to permanently retain sufficient volume to fulfil the indications. In consequence of his experience, he confines the measure to children, and to those adults who will not part with any sort of an eye unless they are promised that another will be substituted for it, and a better one than that which is given up. C. H. B.

## OPTICS.

THE QUESTION OF THE DESIGNATION OF THE AXES OF CYLINDERS.—OPPENHEIMER, Berlin (*Woch. f. Therap. u. Hyg. des Aug.*, March 4, 1909), says that for a system to become universal it should possess the following qualities: It should be easily understood, rapid, acceptable, i. e., not so different from present methods as to make it unacceptable.

1. It must be understandable alike both to the optician and the ophthalmic surgeon. Especially must it be readily understood by the optician. This the author thinks can only be obtained by designation upon a printed schema of the direction of the axis.

2. The least time is consumed in the writing of one number, therefore the indicating of the axis up to 360 degrees has nothing to recommend it. So that there remains but the numbering up to 180 degrees.

3. There are three ways of designating the axes by this method—with zero either to the right or left or both in the middle of the horizontal axes. For the latter is claimed that when the axes are symmetrical they will have both the same number. In the opinion of the author, this has little weight, as the subtraction from 180 requires no great mathematical skill, and that

absolute symmetry is not present in the majority of cases.

Furthermore, in America and to an extent in England, the method of having the zero at the right hand end of the horizontal meridian is in vogue. If it were not for this, either of the other two methods would be acceptable. But when not a small number of our colleagues have adopted a method ("standard notation"), it seems to the author wise to accept the "standard notation." W. Z.

How Shall We Protect the Eyes from the Ultraviolet Rays' Artificial Illuminants.—Schanz, Dresden (*Graefe's Arch.*, LXIX, H. 1, Aug. 28, 1909). The author first considers the richness of our artificial lights in ultraviolet rays, and shows that the higher the temperature of a luminous body, the higher the proportion of the invisible ultraviolet rays to the total number of rays. He considers the various illuminants—oil, gas, electric incandescent lamp, electric arc light, and divides them into three classes relative to the abundance of ultraviolet rays: 1, poor; 2, relatively poor; 3, rich. To the first class belongs the Roman olive oil lamp, the candle and the open rape seed oil lamp. To the second, rape seed oil lamp with chimney, the petroleum flat and round burner, the gas, flat and argand light. In the third class belong all lamps with incandescent mantles: petroleum, alcohol, hanging and stationary incandescent gas lamps. Still richer in ultraviolet rays are acetylin light, all incandescent lamps, such as the carbon filament, the nern lamps, metallic filament lamps, and especially all arc and mercuric vapor lamps.

The harmful effects of these rays upon the eyes manifest themselves in the following forms: 1. Electric ophthalmia, catarrhal symptoms of the palpebral conjunctiva, injection and marked chemosis of the bulbar conjunctiva, elevation of the epithelium of the cornea with corneal opacities, contraction of the pupil and disease of the iris, influence of the rays reaching the retina as shown by erythropsia. Lenticular opacities and alterations in the capsule of the lens have been observed experimentally. This leads the author to consider whether the ultraviolet rays are a factor in the production of senile cataract. He points out that Fuchs has shown that after excursions upon the glaciers, on entering a dark room erythropsia is noted, due to the exhaustion of the protective power of the lens upon the ultra-violet rays. He cites the case of lenticular opacities in the pupillary area beneath the anterior capsule of the lens in a man 45 years of age, who had from 25 to 30 attacks of electric ophthalmia. The opacity ended in a straight line corresponding to the margin of the upper lid, when the eyes were half closed. There were also peripheral striae.

Investigations were made into the absorptive properties of different varieties of glass for the ultraviolet rays of 400cc-300cc. A glass having the trade name of euphos glass has this quality. A glass recommended by Voigt was efficient when from 6 to 8 mm. thick, which the author thinks impracticable.

The author's investigations show that: 1. Our artificial light source becomes more and more possessed of ultraviolet rays. 2. That these rays are harmful to the eyes. 3. That the glass now used in these lamps affords insufficient protection from these rays. 4. That euphos glass gives much protection from these rays without decidedly weakening the visible rays.

W. Z.

Size Versus Distance in Test Types.—Schulin, Carl, M. D., Billings, Bont. (*Annals of Ophthalmology,* April, 1909). The author says the cards that are used in this country and bear the name of Snellen are not correct, as the description does not answer Snellen's Optotypi. These charts only conform to the requirements by the U. S. Bureau of Pensions. Snellen's chart contained only seven rows of letters of such sizes that they subtended an angle of five minutes in distances ranging from 60 to 6, respectfully 50 to 5, metres. After having determined the smallest letter which the patient can see at 6, respectfully 5 metres, he has the patient move from the chart to see the letter at a greater distance. This is the essential feature of the Snellen's optotypi. The graduation of distance was altered by Green and endorsed by the American Ophthalmological Society, the visual angle remaining the same, namely five minutes, as by Snellen. Neither Snellen nor Green published on their charts the sizes of their letters. The first edition of Snellen's Optotypi was accompanied by a pamphlet containing the sizes, but was omitted from the second edition.

Comparison of charts from the various publishers show the confusion of sizes of test type. (The reviewer has observed this fact a number of times.)

The author suggests a chart of squares 5-16 in. side and draw letters into them, the component lines of which are 1-16 in. thick. To these some larger and some smaller are added in arithmetical progression, the numerator of the fraction indicating the sizes must, however, always be divisble by 5. If the size fractions are expressed in sixty-fourths, their numerators tally with the denominators of the corresponding vision fractions, as follows:

| | | | | | |
|---|---|---|---|---|---|
| Vision, | 40/10 | Size, | 10/64 | in. | (5/32) |
| “ | 20/15 | “ | 15/64 | “ | |
| “ | 20/20 | “ | 20/64 | “ | (5/16) |
| “ | 20/25 | “ | 25/64 | “ | |
| “ | 20/30 | “ | 30/64 | “ | (15/32) |
| “ | 20/40 | “ | 40/64 | “ | (5/8) |
| | | etc., until | | | |
| “ | 20/200 | “ | 200/64 | “ | (3 1/8) |

The author devised his chart from the above calculations. (This might have been brought before the Section on Ophthalmology of the American Medical Association for examination and endorsements.—Reviewer.) A. M. MacW.

## OPTIC NERVE.

Investigations into the Origin of Papilloedema.—Thorner, Berlin (*Graefe's Arch.*, LXIX-H., 3, Jan. 5, 1909). As the result of animal experimentation, Thorner concludes: Upon physical grounds, it is unlikely that increased intracranial pressure should extend to the papilla, because of the capillary resistance offered by the intervaginal space of the optic nerve sheath. But if such an extension occurs, it must manifest itself also in the supravaginal spaces and the spaces of Tenon's capsule, producing an exophthalmos. Vice-versa, an exophthalmos from other causes should increase the intracranial pressure.

Experiments heretofore made which indicated that the papilloedema was the result of increased intracranial pressure are not free from objection. The author's experiments to produce a local increase of pressure through retrobulbar injection of inert substances were without result; but marked oedema occurred when injections of various inflammation excitors were made. Clinical observations also show that the picture of papilloedema may be present without increased intracranial pressure.

The presence of toxines is to be assumed in increased brain pressure, as they injure the cells of the depletory Pacchionian granulations, as a tumor through its volume alone can rarely cause increase of pressure.

For these reasons the author believes that the theory of Leber which attributes the papilloedema to toxines best explains the known phenomena. W. Z.

ON THE PARTIAL CAVITIES OF THE PAPILLA OF THE OPTIC NERVE.—FRENKEL (*Annales d'Oculistique,* February, 1909).

Frenkel discusses the cases in which the papilla presents a localized excavation distinct from the physiological one. In the case reported there was a round disc one-third dd. in diameter on the temporal side of the papilla, with a deep excavation the depth of which is not definitely stated.

This affection is usually unilateral, and the excavation is nearly always on the temporal side. In one case recorded there was a double excavation. In most cases the eye was nearly or quite emmetropic, and as a rule, there is no disturbance of vision.

It is a congenital condition, and may be considered as a typical coloboma.

No opportunity for anatomical examination has occurred.

G. C. H.

## PARASITES.

CYSTICERCUS OF THE VITREOUS HUMOR.—WERNICKE, OTTO, Buenos-Ayres (*Anales de Oftalmolgía,* October, 1908).

In Argentina cysticercus is rare, while echinoccus is frequent, which is due to the fact that the flesh of the pig, in which the "tenia solium," tape-worm, lives in a quiescent state, is little used as food.

M. M., 25 years old, Italian and married, living in Argentina for five years. Healthy till June, 1907, then noticed in her R. E. a fine thread, like a hair, which grew till it took the form of a lentil; at the end of two months it completely covered the sight. She then noticed that it took the form of a clove and that it had exension and retraction movements.

Examination: Cornea, anterior chamber and iris, normal; crystalline lens, transparent. Dilating the pupil with atropine, a blue reflection is seen in the upper part. With the ophthalmoscope is seen in the upper-interior part of the vitreous humor a vesicle with iris-colored borders (red, golden and blue), of a dark color of the size of the crystalline lens, and without vessels on its surface. This vesicle has a white spot on its lower part, near which is seen the neck and head of the cysticercus, lodged within the vesicle and moving. The suckers and rostel are clearly seen. The vesicle makes movements when the eye moves. The remainder of the fundus of the eye seems normal. V.=light. After some days the cysticercus can be seen by the naked eye in the pupillary field.

An attempt was made to extract the cysticercus through a sclerotic incision, but it was not successful.

The author reviews five cases of cysticercus published in his country, and announces that Dr. Demaria will publish another case of cysticercus of the orbit, which, with his, will make seven. J. de J. G.

Report of a Case of Sub-Retinal Cysticercus.—Lopez, Fernando, Mexico (*Anales de Oftalmología*, October, 1907).

In February, 1907, the author saw, for the first time, the wife of a distinguished physician, who one month before had been noticing a shadow in a place of the left field of vision. The patient, a strong, healthy woman, presented to the campimetric examination of the L. E., a large scotoma. By the ophthalmoscope was observed a little yellowish white spot, under and outside of the pupil (inverted image); the rest of the fundus was normal. By carefully looking, the author noticed that the little spot, whitish in general, had in the bottom a whiter point, circular and with well-defined outlines. The distance of the spot from the optic nerve was a papillary diameter, and its situation subretinal, because a vessel of the retina passed over it. To the upright image the spot was seen above and inside, the pupil, and formed an eminence above the retinal level, for the refraction was different on the spot than it was on a neighboring point.

The author thought it was cysticercus, and, on inquiry, he learned that the patient had eaten ham and other preserves. He administered a tape-worm purgative, and the patient expelled a tape-worm, tenia solium.

As the eye still kept a fair visual acuteness, the author, with Drs. Ramos and Chevez, decided to wait; but during the course of two months, the vesicle increased, broke the artery which passed over it, occasioning an extensive hemorrhage and separation of the retina, considerably lowering the sight, till it was reduced to the peripheral vision.

The author then decided to extract the vesicle. He made several trials on the cadaver and after fixing the surgical technique, he proceeded, with chloroform, as follows: After having placed the blepharostat and pulling down the eyeball, he made at one centimeter above the cornea and on the conjunctiva, a transverse incision, a centimeter and a half in length; sought the tendon of the upper rectus, passed a strabismus hook under it and separated the muscle as far as possible, so as to leave it isolated from the neighboring tissues. The tendon was fixed with an advanced forceps half a centimeter above its insertion. He made a section, with the scissors, immediately below the forceps, the upper end remaining fastened. He passed, with curved needles, a thread, to each side of the muscle, so as to prepare the future sewing of the tendon, holding the ends of the threads with Pean forceps and removing the fixing forceps. With the same forceps the insertion end of the tendon was sought and the eye pulled strongly downward, making it execute a rotation sufficient to pull forward the posterior pole. The sclerotic was uncovered as much as possible, and on this membrane was made, with a cataract knife, a meridional incision, one centimeter long, in the place where the ophthalmoscope had found the cysticercus. The chorioid was uncovered and, before opening it, so as to insure a clean field, after separating the lips of the sclerotic wound with Stevens' tenotomy hooks, he dropped a few drops of normal adnephrine solution. After a few moments, the field of operations being strongly illuminated with an electric light, he made a small puncture in the chorioid, completing the incision with very fine straight scissors, without hemorrhage, and a little subrétinal serousity escaping. When the lips of the wound were half opened, the cysticercus was seen to appear, and it was gently drawn out with a Levis spoon. Not a drop of vitreous humor escaped, as the retina was not opened. The lips of the sclerotic wound joined each other of themselves; they were sutured with the same threads, the two ends of the tendon and the conjunctiva.

On examining the eye with the ophthalmoscope immediately after the operation, the mediums were found transparent and, without any extravasation of blood into the vitreous humor.

A binocular bandage was applied, and was not changed till the tenth day, when it was applied to the healthy eye only.

The improvement went on notably, and, at the time when the author publishes his observation, the central parts of the field of vision have bettered and large objects are seen.

The ophthalmoscopic examination shows: Transparent media, optic papilla slightly atrophied, thin vessels, and a spot of atrophy of the choroid and the sclerotic scar where the cysticercus was.

The examination of the latter showed that it belonged to the tape-worm, tenia solium. J. DE J. G.

## PATHOLOGY.

NOTE ON THE PATHOLOGY OF THE PUPIL.—SOMMER, Zittau (*Wochensch. f. Therap. u. Hyg. d. Aug.,* March 18, 1909). The following observation was made by S. in an epileptic with glaucoma. Under the repeated use of eserine, the pupil had continued contracted ad maximum. During the convulsion, both pupils immediately became dilated and fixed. The T. remained unchanged. After the attack the pupils remained for a time of medium diameter, and the reaction slowly returned. The pupil of the glaucomatous eye, which then for days remained unchanged, in spite of strong miotics, became more and more contracted, until it became as small as before the attack. The author awaits an explanation of these unusual phenomena. W. Z.

HISTOLOGICAL INVESTIGATION OF A CASE OF BLEPHARO-CONJUNCTIVITIS CAUSED BY THE DIPLOBACILLUS OF MORAX-AXENFELD.—PUSEY, BROWN, Chicago (*Arch. Ophthal.,* Jan., 1909, xxxviii, 8), gives the results of histological examination of the lids in a case of blepharo-conjunctivitis, due to Morax-Axenfeld's diplobacillus. The tissues were obtained, post-mortem, from a man who had been subject to a chronic type of this form of conjunctivitis. The histopathology of the four regions, the lid edge, the tarsal conjunctiva, the conjunctiva of the fornix, and of the eyeball, is described separately.

Pusey summarizes the results of his study as follows: "In the lid edges there is an invasion of the deeper tissue by epithelial cells in the form of cone-like ingrowths; the superficial pavement layer of cells is thinner than normal at the posterior edges of the lids, and these cells do not show keratohyalin changes; the glands emptying on the lid edges are unaffected. The conjunctiva of the tarsus is much thickened, and in it there are folds and tubules; there is great desquamation of epithelial cells and the epithelial cells show a moderate tendency to undergo mucoid changes; within the folds and tubules there are diplobacilli; there are diplobacilli between the superficial cells of the epithelial cell layer; wandering cells in large numbers are found between the cells of the epithelial layer; the subepithelial tissue of this region is fairly vascular and is the seat of diffuse infiltration of new cells, of which plasma cells are the predominating ones; no bacteria are found in the subepithelial tissue. The epithelial cell layer of the transsitional fold shows a great increase in cells, and the cells show a very marked tendency to undergo mucoid change; i. e., there is marked desquamation of cells, but at no place is there complete desquamation of cells as in some other forms of conjunctivitis; desquamated cells and debris appear to be held in contact with the epithelial cell layer by means of mucoid shreds, which remain adherent to mucoid cells, which in turn hold their position in the epithelial cell layer; in this debris and other debris in the folds of the conjunctival sac, there are Morax-Axenfeld diplobacilli; between the superficial cells of the epithelial cell layer there are Morax-Axenfeld diplobacilli; the subepithelial tissue of this region is like that of the similar region of the tarsus. The epithelial cell layer of the bali shows a moderate tendency to undergo mucoid change; along the surface debris adheres as on the surface of the conjunctiva of the transiitional fold, and in this debris there are Morax-Axenfeld diplobacilli in abundance; between the superficial cells of the epithelial cell layer there are diplo-bacilli; the subepithelial tissue of this region is like that of the similar region of the tarsus, but much less involved. At the limbus in the episcleral tissue there are epithelial cell ingrowths which show necrotic areas."

Pusey found involvement of the glands of Krause and believes that the difficulty met with in eradicating these organisms from the conjunctival sac is due to the involvement of these glands. He also found ingrowths and necrosis of epithelial cells at the limbus, and believes that this may be one mode of circumcorneal catarrhal ulcers, which sometimes complicate chronic conjunctivitis. W. R. M.

THE EPITHELIAL CHANGES IN TRACHOMA AND OTHER CONJUNCTIVAL DISEASES.—STARGARDT, Strassburg (*Graefe's Arch.*, LXIX, H. 3, Jan. 5, 1909). The studies of this author have brought him to the following conclusions: That epithelial changes of great variety of form occur in all forms of conjunctival diseases, but that typical inclusion, first seen and described by v. Prowazek, are demonstrable only in recent trachoma. They are not found in old cases, or in cases long treated. Whether all fresh cases show the characteristic cell changes, the author was unable to determine, because of the rarity of the disease in that stage, in his vicinity.

What the significance of the inclusions is whether cell degeneration, or parasitic, or cell reaction excited by the latter is left undecided, but Prowazeksche views the most likely.

The view that the excitor of trachoma has its location principally in the epithelium does not seem strange, when we recall that there are a great number of protozoa whose situation is epithelial.

The presence of Prowazeksche's bodies is evidence of trachoma, but its absence is inconclusive. Their presence or absence is at present of no value in determining whether a case is still contagious.

Prowazeksche is of the opinion that the trachoma excitor is capable of mutation, and may undergo biological changes in its transmission through apes similar to those which variola virus undergoes. W. Z.

## PHYSIOLOGY.

INVESTIGATIONS INTO THE ELECTRIC CONDUCTILITY OF THE EYE.—HERTEL, Jena, (*Graefe's Arch.*, LXIX, H. 1, Aug. 28, 1908). The experiments conducted by H. show that different individuals of the same species exhibit variations in the conductility of the eyeball within relatively narrow limits, the average for rabbits being 45.4.10 ohm, and for man 32.4.10 ohm. Inflammatory processes do not seem to influence the conductility, but a wound of the scleratic exerted the greatest influence. The current passed much more readily through the ball when the electrode was placed within the vitreous than when applied to the sclerotic. This is to be explained by the greater possibility of dissociation of the molecules, because of the greater watery elements of the vitreous.

The conductility of the aqueous humor is the same as that of the conductility of the serum of the same animal under like conditions. W. Z.

THE RELATIONS OF THE MEDULLA OBLONGATA TO THE PUPIL.—BACH, L., and LOHMANN, A., Marburg (From the Physiologic Institute and the Eyeclinic at Marburg (*Klinische Monatsblaetter fuer Augenheilkunde,* XLII, 1909, II, p. 268). As the investigations of Bach and Meyer on the relations of the medulla oblongata to the pupil were opposed by Bumke and Trendelenburg (*Klinische Monatsblaetter,* XLV, 1907, p. 353, reviewed in Ophthalmology), they were again taken up with the result, that the conditions were much more complicated than hitherto supposed. Narcosis, to which Bumke and Trendelburg surmised that the miosis and immobility of the pupil to light, observed by Bach and Meyer, might be attributed, could almost with certainty be excluded. It may be due to shock. The conditions in the cat are so complicated that the assumption of physiologically important centers for the pupillary reflex in the medulla must appear questionable. The author, from these observations, consider the possibility of deciding the question in the excluded. C. Z.

## REFRACTION AND ACCOMMODATION.

THE NECESSITY OF USING A MYDIATIC IN REFRACTION.—MORROW, EDWARD PAYSON, Canton, O. (*Cleveland Medical Journal,* March, 1909). After referring to the early history of the use of glasses, and mentioning some of our more modern students of the laws of light and optics, the writer emphasizes the need of precision in the correction of refractive errors. He concludes: "A mydriatic is absolutely necessary to unmask a latent error of refraction. To make a precise correction, the latent error must be made manifest with a mydriatic. A mydriatic should be used in all cases under 48 years of age, when objective tests show the existence of an error of refraction—glaucoma excluded. A mydriatic in skilled hands is not dangerous. On the contrary, aside from its use in unmasking the error, it has a beneficial therapeutic effect in asthenopia."

M. D. S.

HEADACHE OF OCULAR ORIGIN.—SATTLER, ROBERT, Cincinnati (*Ohio State Medical Journal,* April 15, 1909). The writer makes his first subdivision of the subject, "The ocular, the sole cause of headache." These cases are generally first seen by the oculist, and are usually promptly relieved by accurate optical correction. Heredity is chiefly responsible for the eye deformities present. He next considers, "The ocular an associate, but wholly latent cause of headache." These cases are usually first seen by the general practitioner or specialist in another line. He says that while lenses may benefit some, with a large number, the optical correction, prism exercises, etc., are mainly justifiable as part of the general treatment for the other causes in evidence, or to aid these as possible suggestive measures in the moral management, which is of equal or greater importance in these cases. He discusses, "The ocular as a dominant and active associate cause." He believes that optical and other special treatment will relieve head pains due to inherent or acquired ocular causes, and that share of the general nervous tension, depression or extreme exhaustion which the eyes contribute, but questions whether the more uncommon headaches of hysterious origin, such as migraine, circular headache, habitual headache, etc., are more than favorably modified by the ocular treatment which may be indicated. He warns against assuming an ocular cause for head pain of grave central or other origin, and urges a more rational and searching diagnostic interpretation of the general symptoms of head pains and the other causes which create them. M. D. S.

THE VISUAL ACUITY OF HYPERMETROPES WITHOUT GLASSES. —v. REUSS, Vienna (*Graefe's Arch.*, LXIX, II, 1, August 28, 1908), from the result of the study of the eyes of 1,400 hypermetropes with a V.=6/vi, in persons ranging from 6 to 90 years of age, and with H. ranging from 0.50 to 6 D., arrived at the following conclusions: That manifest H. is in many cases and in entirely normal eyes with normal visual acuity at an early eye becomes in part absolute and uncorrected vision sinks below normal. The conditions under which this occurs are not known. Particularly high latent H. appears not to be the cause.

Females are absolutely at a disadvantage as compared to males. V. sinks earlier and greater. The early age at which the manifest H. becomes absolute is not alone a peculiarity of higher grades of refraction error, but may occur also in very low grades. W. Z.

## RETINA.

Differential Diagnosis Between Idiopathic Detachment of the Retina, and Detachment Secondary to Sarcoma of the Chorioid.—Domec, Dr., Dijon (*L'Ophthalmologie Provinciale,* Nov., 1908). In the idiopathic form the portion detached, when viewed with the ophthalmoscope, generally appears as a grayish mobile surface, composed of folds and creases or undulations. Over all run the sinuous retinal vessels, arteries and veins, both showing darker than normal, and no sign of the underlying choroid is visible. In detachment secondary to a tumor,—which is nearly always a sarcoma, the retina over it is smoother, i. e., not thrown into folds, the limits of the retinal separation are more sharply defined, the whole is but slightly movable, or not at all, the retinal vessels, save at the borders of the detachment, are much less tortuous. In short, its aspect is more that of a sort of dome—more or less rigid. Unfortunately, these characteristics are by no means constant, but merge into each other in the two forms. The surface of the detachment must be studied minutely, with dilated pupil and very strong illumination, preferably the direct method. By using a concave mirror held very close to the eye, and turning on various convex lenses, one can examine not only the surface, but can, in a measure, look into the detachment, as it were. In this way, one may often see a second pathognomonic of the presence of a neoplasm. When a detachment is situated between the equator of the globe and the ciliary body, and the signs just mentioned are not positive, the transillumator may render great service. (The method of using this instrument has often been described in "Ophthalmology.") Another sign of great value, when present, is a bloody infiltration of the detached retina, evincing a tumor. Minor signs are those, for instance, as to location. A tumor is to be suspected when a circumscribed detachment appears at the vault of the vitreous chamber, or in the macular region. Detachment with hypertension, be it ever so slight, is suggestive of a tumor. So is slowly progressive failure of vision, instead of sudden or rapid; as also the persistence of good or fair vision with a rather extended detachment. Close study of the field of vision may furnish a clue. The limits of the scotoma in simple detachment are less precise than are those of the secondary. In conclusion, Dr. Domec warns the examiner to remember that, in rare instances, the tumor is found diametrically opposite to the point where the detachment is located. Hence the importance of close scrutiny of the entire fundus.

C. H. B.

Excavation of the Macula, with Some Cases Showing its Association with Atrophy of the Macular Bundle.—Butler, T. Harrison, England (*Ophthalmoscope,* Jan., 1909). The anatomical arrangement of the macula makes it the point of least resistance of any portion of the retina. It therefore gives way easily when the retina is put on a strain from a blow. It is also easily damaged from disease. Four cases are reported, some of which were retinal holes, and some depressions from atrophy. None of them were caused by traumatism. M. B.

## SCLERA.

Episcleritis Periodica Fugax, with the Report of the Case.—Wyler, J. S., Cincinnati, O. (*Ophthalmic Record,* Feb., 1909). A maiden lady of 40 years who had suffered from recurring attacks of inflammation of one or both eyes for four years. The attacks seem to have been associated with her periods of menstruation. Her general health good, except for constipation, and irregular frequent menstruation. The attacks come on suddenly and are evidenced by the lower outer quadrant of the ocular bulb assuming a dusky blue color and by a small localized oedema. The area beneath shows the dilated ciliary vessels. Cornea not involved. She continued to have these attacks about every two weeks. Treatment was of value only in shortening and causing the attacks to be milder. Dionin was of the most value as a local measure. The author believes the local ocular inflammation to be the expression of a deranged physical state. More or less disagreement exists upon what this state of derangement is, the greater number favoring a gouty diathesis. M. B.

## SINUSES, NOSE AND EAR.

Bilateral Orbital Phlegmon, Bilateral Thrombosis of the Ophthalmic Vein and the Cavernous Sinus after Ethmoidal Empyema.—Gutmann, Adolf (From the Eye-clinic of Prof. J. von Michel in the University of Berlin, *Zeitschrift fuer Augenheilkunde,* XXI, 1909, p. 32). A man, aged 29, was seized with intense coryza and headache, which grew worse the next day, so that he consulted a physician. On the third day the condition of the patient was very much changed. He tossed around in bed, had 39 c. and 100 pulse. The eyelids were suffused with blood, the lower retrotarsal folds very much swollen and infiltrated with hemorrhages; exophthalmus on both sides. At the consultation with G. the patient stated that he could not see. The ophthalmoscopic examination revealed venous stasis of the retinal veins. G. diagnosed bilateral thrombosis of the ophthalmic vein and the cavernous sinus. The local symptoms increased, and the patient died the next day.

The postmortem showed basal cerebro-spinal meningitis, intense bilaterial empyema of the ethmoidal cells and purulent, partly disintegrated, thrombi of both cavernous sinus, heart and lungs normal. The contents of the orbits with the conjunctival sac and lid apparatus were removed in toto and fixated in 10 per cent. formalin. Various sections, which are illustrated and described in detail, disclosed ascending septic thrombosis of the ophthalmic vein and all its branches, from its entrance to the eyeball, in the muscles, pial sheath, perineurium, abscesses and small-celled infiltration of the orbital tissue.

Apparently the whole process was this: A pre-existing slight chronic ethmoidal empyema was reinfected simultaneously with the acute coryza, and by rapid perforation at the typical point of the lamina papyraces produced a diffuse orbital phlegmon. The perforation could be proven by an abscess near the left internal rectus muscle, which had not remained subperiosteal, but spread into the orbital tissue and caused the intense exophthalmus. The phlegmon was rapidly propagated along the optic sheaths to the meninges, with resulting basal septic meningitis and exophthalmus of the other eye. Undoubtedly the orbital phlegmon was exophthalmus of the other eye. Undoubtedly, the orbital phlegmon was primary and the thrombosis of the ophthalmic vein secondary from propagation of the inflammation to the wall of the vein, which extended in the vein to the cavernous sinus and, as the postmortem showed, through the circular sinus to the right cavernous sinus. In this case the orbital symptoms preceded the cerebral, and proved the centripetal march of the thrombophlebitic process from the orbit. This was important, as the modus may be reversed, as observed by Uhthoff, viz., secondary thrombosis of the cavernous sinus and the ophthalmic vein.

Unilateral septic thrombosis of the orbital veins and the cavernous sinus has been frequently observed, whereas bilateral thrombosis so far occurred only in 10 cases. In pure otitic thrombosis of the transverse and sigmoid sinuses, thrombosis of the cavernous sinus and affection of the orbital contents are always secondary. Uhthoff found in about 9 per cent. out of his collected cases of otitic thrombosis exophthalmus, which the autopsy always showed to be caused by thrombosis of the cavernous sinus. C. Z.

ON RHINOGENOUS OPTIC NEURITIS.—PAUNZ, MARC, Budapest (*Arch. Ophthal.*, Jan., 1909, xxxviii, 19. Translated from the German edition, Vol. LXI, No. 4, by Dr. Percy Fridenburg, New York), gives the clinical histories of the following six cases observed at the eyeclinic of the University of Budapest: 1. Hemorrhagic papillitis and acute retrobulbar neuritis, O. D. suppuration in posterior ethmoid cells, right side. 2. Acute papillitis and retrobulbar neuritis, O. D. acute rhinitis and posterior ethmoidal sinusitis, R. 3. Acute retrobulbar neuritis with papillitis, O. U. empyema of maxillary, ethmoid and sphenoid sinuses, L. 5. Retrobulbar neuritis, discolored discs, O. U. chronic ethmoidal and sphenoidal suppuration, L. 6. Acute retrobulbar neuritis, O. U. ethmoidal suppuration, R. and L.

In cases 4 and 5 there was optic nerve atrophy, due to the chronic sinus disease. In case 6 there was no fundus change. In case 3 there was papillitis, but no sinus suppuration. With the exception of case 4, vision had failed rapidly, and cases 5 and 6 were brought to the clinic blind. Central and paracentral color scotoma were present in five of the cases.

The author states that disease of the posterior ethmoid cells causes neuritis more often than does sphenoid sinus suppuration , and that "congenital dehiscences in the bony walls may play a part, but it is more probable that blood vessels and lymph-channels are the main pathways, and that osteophlebitis, periostitis, and perhaps bone necrosis are the most important contributing factors. Neuritis developing rapidly and subsiding promptly, without permanent impairment of function and without lasting fundus changes, would speak in favor of simple compression or collateral oedema. True optic neuritis might be inferred, where we have ophthalmoscopic signs of degeneration, permanent impairment of vision, and defects or contraction of the visual field." W. R. M.

THE SPHENOIDAL SINUS AS A POSSIBLE ETIOLOGICAL FACTOR IN THE PRODUCTION OF RETRO-BULBAR NEURITIS FROM AN ANATOMICAL STANDPOINT: OBSERVATIONS ON SIXTY SPECIMENS.—FRANCIS, L. M., Buffalo, N. Y. (*Ophthalmic Record*, Dec., 1908). Sixty adult skulls were examined. All the soft parts were removed and the bones dried. The thinnest portion of the sphenoidal sinus wall is in touch with the optic nerve, where it winds around the side of the sinus or where it joins with its fellows to form the commisure behind the sinus. This bony wall was found in one-third of the specimens to be ¼ mm. in thickness and in 30 per cent. ½ mm. The remainder were from 1 to 2 mm. in thickness. In 17 per cent. there were diverticula from the sinus which approached or invaded the orbital wall. In many specimens the optic nerve canal presented itself as a distinctly rounded ridge in the sinus wall. Careful inspection of recent specimens failed to reveal arteries of demonstrable size in the lining membrane of the sinus. It is therefore assumed that the sinus depends for its arterial supply, in part at least, upon the periostium of adjacent cavities. In view of all these findings, the author thinks it highly probable that an inflammatory condition of the sinus is very likely to extend through this thin wall and cause damage to the optic nerve. M. B.

THE OPHTHALMIC ORIGIN OF OTIC DISTURBANCES WITH THE CEREBELLAR CONTROL OF THE EYE.—LEWIS F. PARK, Buffalo, N. Y. (*Ann. Ophthal.*, Jan., 1909). Clinical evidences from his own and others' experiences are cited to show that such relationships exist between the eye and the ear, and that an irritation or improper functioning of the former may be manifested in a disturbance of some character in the latter. He also shows anatomically what these relationships are, and that a complexus of symptoms closely resembling those of Miniere's disease may be produced through incoördinate action of the eyes. He also points out that in the physiology of vision the cerebellum exercises governing functions. M. B.

REFLEX NEUROSIS ARISING FROM OCULAR AND NASAL ABNORMALITIES.—ZIEGLER, S. LEWIS, A. M., M. D., Philadelphia

(*New York Med. Journal*, Nov. 7, 1908). Reflex neuroses are not the property of the savage, but of civilized man. The more refined we become in the crucible of civilization, the more must we pay the penalty of that civilization through the neurotic tendencies which we inherit or acquire. He believes that the underlying neuropathic predisposition is present in a large number of the American population, and when not inherited is due chiefly to the changeable climate, as shown by Mitchell and Lewis, in their study of chorea.

The importance that Stevens and Ramsey attach to eye strain and their method is given, Noyes corroborating some of Ramsey's cases. Zeigler considers that there are many biased observers. To the unbiased observer he considers four ocular factors which may become the exciting cause in producing reflex neurosis:

1. Ciliary spasm, or strain from uncorrected ametropia.
2. Accommodative effort, whether in youth or old age (presbyopia).
3. Muscular imbalance.
4. Painful ciliary spasm or shrunken eyeball. These factors are liable to originate reflex symptoms in neurotic subjects, the phlegmatic escaping.

1. Eyestrain from uncorrected ametropia stands first. Ascertain carefully total refractive error; make due allowance for free play of the ciliary muscle in Rx for glasses. Failure at this point may wholly annul our efforts to remove the exciting cause. In other words, prescribe the happy medium.

(It is evident that the author does not believe in the theories of Jackson and Dixon.—Reviewer.)

2. Unusual accommodative strain is a fruitful source of reflex disturbance. Accommodation should be tested carefully in every case for far and near.

3. Extra ocular imbalance has long been conceded as the most vicious agent of these reflex neuroses. Errors in the vertical are probably the most active.

4. Painful scars may cause annoying reflexes and scars in the ciliary region are no exception to this rule. The author calls attention to many cases that wander from one oculist to another without any relief, are really nasal asthenopia, never finding comfort until the nasal condition is corrected. He considers the three active etiological factors: 1st, pressure contact;

2nd, hyperasthesia; 3rd, nasal obstructions. Headaches he considers one of the most prominent symptoms of eye strain. A "Sunday morning headache" is usually nasal in origin, the result of prolonged pressure contact following overindulgence in sleep; a "Monday morning headache" is more liable to be due to indiscretion of excessive Sunday reading, and is therefore ocular in origin. (*Sic!*) He also speaks of a "theatre headache" arising from three causes: 1st, light annoyance in heterophoric patients; 2nd, unusual strain of both sup. recti, from sitting too close to the stage.

3. Eye strain of ametropia. Cases are then given that the author has had, in which the nasal condition was at fault, where appropriate treatment to the nose resulted in a disappearance of the eye symptoms. A. M. MacW.

## SYMPATHETIC OPHTHALMITIS.

Consideration of the Nature of Sympathetic Uveitis Occasioned by the Observation of a Peculiar Instance of this Affection.—Heefordt; Copenhagen (*Graefe's Arch.* LXIX-H. 3, Jan. 5, 1909). The interesting features of the case were the occurrence in the injured eye of a decided neuritis and a beginning cyclitis on the 13 day; 2 months later cyclitis gone, the neuritis unchanged, 4 months later the neuritis gradually disappearing; in 5 months a slight iritis; between the 5 and 10 month a slight choroiditis with vitreous opacities, the optic neuritis unchanged or slightly increased. In the sympathizing eye: on the 13 day a beginning neuritis; in 18 days a cyclitis and in 2 months was rapidly subsiding relapse; 5 months a slight iritis and between the 5 and 10 months a chorioiditis.

From a consideration of the above facts the author draws the following conclusions, some of which he considers hypothetical:

1. The s. o. is characterized by a specific inflammation (described especially by Schirmer, Ruge and Fuchs).

2. This without doubt is caused by a specific microbe which has an elective effect upon the uvea, is sometimes present in the conjunctiva and possesses marked penetrative powers (a spirochaeten form with spontaneous movement).

3. The infection usually has a period of incubation of about 14 days and is the cause, in such cases where the uvea, because of the inpurity or similarly direct infection from without (conjunctiva). As a rule the second eye is infected from the uveal

inflammation of the injured eye, in rare cases, however, direct from the point of injury. On this account it is possible within limits, that the infection may originate elsewhere especially from other mucous membranes (particularly, perhaps the mucous membrane of the genito-urinary organs). The infection is conveyed along the usual lymph and blood channels. It has not been entirely excluded that, under certain conditions, the lymph passages along the optic nerve may play a part in the transmission. The lesion existing in one eye is pathogenic for the other and occurs soon after the outbreak of the inflammation in the first. These cases of sympathetic uvetitis which occur late after a perforating injury are excited by a later infection (through the traumatic cicatrix).

The optic neuritis which occurs so frequently in cases of sympathetic uveitis occurs under certain circumstances also, how often is unknown, as the first demonstrable symptom of the uvetitis is the sympathizing eye. W. Z.

Sympathetic Ophthalmia with Report of Pathological Findings in Two Cases.—Baker, A. R., Cleveland, O. (*Ophthalmic Record,* March, 1909). An eye operated upon for senile cataract developed iridocyclitis on the third day, which ran a protracted course. The eye finally became quiet with a closed pupil. Some four months later sympathetic ophthalmia developed in the fellow eye. The exciting eye was not removed. The sympathizing eye ran a tedious course and finally became quiet. The exciting eye was then operated upon, and a good pupil obtained by making an iridectomy with Stevens punch. Vision of 10/cc. was obtained, but soon failed, the eye becoming soft and blind. It was enucleated and the pathological findings are reported at length by Dr. E. P. Carlton. The sympathetic eye being quiet, a preliminary iridectomy was performed and later the lens was successfully removed. Vision of 5/cc. was obtained, but it is rapidly failing and will probably follow the course of its fellow. Sodium salicylate was pushed to toleration several times, without apparent benefit except relief of pain. Better results were obtained from methylsalicylate and colchicine. Apparently more benefit was obtained from the use of mercury which was given more or less continuously for 3 years. Case 2 was that of a man, aged 46, who was suffering from an ophthalmitis induced by a piece of

steel in the eye. The fellow eye was photophobic, irritable, watery and asthenopic. All symptoms of sympathetic irritation soon disappeared in the sympathizing eye. The pathological findings of the enucleated eye are reported at length by Dr. Carlton.
M. B.

## TOXICOLOGY.

A Case of Retinitis, Due Probably to Acute Lead Poisoning.—Vandergrift, G. W., New York (*Med. Record,* March 6, 1909). The writer gives the history of an instance of this sort in which a mild neuroretinitis developed in the right eye and a marked form resembling the classical picture of albuminuric retinitis in the left eye. Right eye, functions normal. Left eye, field contracted concentrically 20 degrees and relative scotoma of lower half of field, V. M. 20/cc. unimproved. No etiological factor could be discovered except lead, the patient having mixed a large amount of white lead with bare hands, a few days before the onset of the ocular symptoms. Treatment consisted of magnesium sulphate and increasing large doses of potassium iodide. In one week the right fundus had cleared up entirely and the vision of the left eye was 20/lxx, much of the exudation having been absorbed. The left eye improved rapidly until at the end of six weeks the vision was normal, the infiltration and hemorrhages having been absorbed. One year later V. normal both eyes; left field normal in outline; striae of connective tissue infiltrate the nerve head and atrophic patches remain about the macula; the patient complains of the relative scotoma over the lower half of the visual field.
C. H. M.

Acute Blepharitis and Conjunctivitis the Result of the Action of the Fresh Leaves of the Origanum Majoranal.—Hilbert, Sensburg, (*Wochensch. f. Therap. u. Hyg. d. Aug.,* Feb. 11, 1909). Shortly after cutting the wild marjoram the patient, a boy of 16 years, was taken with intense itching of the hands and face. This increased and was accompanied by swelling of the skin of the lids with injection of the conjunctiva of the lids and ball and profuse watery mucoid discharge. Under the use of lanolin and ice compresses all symptoms subsided in 5 days. On bringing one of the patient's fingers in contact with the leaves an attack was excited in that locality.

The author believes that the irritant is an ethereal oil.

W. Z.

Argyrosis of the White of the Eye and the Skin. A Rare Disease Due to a Trade.—Hirschberg, J. (*Centrallblatt fuer praktische Augenheilkunde,* 1909, p. 71). Both eyes of a silver polisher, aged 59, who, for 29 years polished on a revolving disc silver plated objects with iron oxid, showed below the cornea a bluish dark gray discoloration of the white of the eye, more so the left, because it was more exposed to the disc. Four m.m. wide, it extended downward from the lower corneal margin, formed a process toward the temporal angle where it spread into single lines, while toward the nose a blackish, somewhat interrupted, line surrounded the plica. The whole face looked somewhat grayish violet. The hair, which originally had been blond and then gray, was yellowish red. After thorough washing it turned white at occiput, but remained reddish on the vertex.

Undoubtedly the affection was due to the local action of silver dust which was thrown for years against the eye with quite a force. The discoloration of the skin might have been due to a general argyrosis from the introduction of silver dust through mouth and nose.

C. Z.

## TRACHOMA.

The Morbid Agents of Trachoma.—Greeff, R., Berlin. (*Deutsche Medicinische Wochenschrift,* 1909, No. 12, p. 517), verified by continued investigations his characteristic findings in the cells and secretions of the trachomatous conjunctiva and feels justified to assert that the morbid agents of trachoma have been found. They consist in very regular, round formations, much smaller than the smallest cocci known. They stain intensely violet or red, according to Giemsa's method, slighter with anilin colors, not at all according to Gram's method. They are surrounded by a light halo. Under highest magnifying power they are not round but oval. Whenever they occur scattered they have the inclination to arrange in Q-like double cocci. They must not be confounded with eosinophile granulations as we see them in leucocytes. In later stages they lie together in heaps, intra-cellular. G. found them in the follicles, free and intracellular, in the epithelia, and free in the viscid secretion.

Only fresh cases, which have not been treated, must be examined, as after a few days' treatment with sulfate of copper the cocci cannot be found. Apparently they disappear from the surface and remain in the depth.

G. recommends the following method: The conjunctival secretion or epithelium taken with the platina tip is spread on the cover glass in a very thin layer, dried and fixed in absolute alcohol for about thirty minutes. Then the cover glass is put, for from 6 to 9 hours, into the staining fluid, so that it swims with the contents downwards. The staining fluid consists of 12 parts Giemso-Eosinsolution (2.5 ccm 1% French Eosinsolution in 500 ccm. distilled water) 3 parts Azur I (1:1000), 3 parts Azur II (0.8:1000). These must be thoroughly mixed and heated to 37 degrees C. After the staining, the cover glasses are irrigated with distilled water, dried with blotting paper and placed into cedar oil.

G. found the trachoma corpuscles at Posen, Berlin, Koenigsberg and in Westphalen, Halberstadter and Prowazek in Java, A. Leber in Austria, Mijaschita in Japan, von Kriidener in Russia. Eight figures illustrate different stages of the corpuscles. C. Z.

The Economic Importance of the Spread of Trachoma in Ohio.—Snyder, Walter Hamilton, Toledo, Ohio (*Ohio State Medical Journal,* March 15, 1909). The writer believes trachoma is greatly on the increase, especially in manufacturing centers and cities having a large foreign population. He believes that inspection alone is not sufficient, especially as that is usually done in this country by a marine hospital surgeon who necessarily has a limited knowledge of the protean forms conjunctivitis may assume. He thinks the most successful inspection is made abroad by the steamship companies because they can more easily get good diagnosticians, as this is a very familiar disease in Europe, and every effort is made by the companies to secure experts. He says that "these cases cannot be cured by the ordinary treatment, but, (a) they must go to a hospital; (b) many must be treated without charge; (c) many will have to be supported and medicine furnished during the cure." After referring to conditions abroad, especially in Germany, he emphasizes the need of health boards declaring it a dangerous contagious disease, all school children in certain districts being examined by experts, forced isolation and medical supervision until a cure is effected, education as to the nature of the disease, and other vigorous measures to stamp out the disease. He believes that any one of the various methods of treatment will cure and on this subject quotes Kuhnt.

M. D. S.

A NEW PROCEDURE IN THE TREATMENT OF TRACHOMA.—COOVER, D. H., Denver. (*Ophthalmic Record*, February, 1909). The technique of the operation is as follows; a general anesthetic is used; somnoform has been chiefly employed. The conjunctival sacs are cleansed. No. O or OO sand-paper is used, and it must be ascertained whether it is pure, and free from glass. The paper is cut into strips four inches long and 3-4 inches wide. These are sterilized by dipping them in alcohol and then burning it off. Care should be taken not to allow the heat to destroy the matrix holding the sand on the paper, thus loosening the sand. The upper eyelid is now grasped along its margin by Darier's forceps and the edge of the lid turned upon itself, and eversion continued until the retrotarsal fold is brought into view. A horn spatula should be inserted under the lid to protect the cornea. A strip of the sand-paper is now rolled around the end of the index finger and holding it firmly between finger and thumb, the entire lid surface is thoroughly and briskly rubbed. By folding or rolling the strip of paper in different ways all the recesses can be reached and the entire surface rubbed down smooth. The lower lid may be treated in the same way. The surface of the lids, and entire conjunctival sac, are now flushed with sterilized water, and all blood washed away, including any sand particles which might have been dislodged from the paper, although the author has never observed any come away, nor discovered a foreign body in the eye after the operation. Cold applications are used for the next six hours. The reaction is slight, the patient returns the next day with eyes open. Following the operation a 2 gr. sol. nitrate of silver is applied to the everted lids as long as there is secretion. After the exudate following the operation has disappeared 1% ichthyol in vaseline is used once daily or 1 to 500 cupric sulph., until the induration has disappeared, which it does in from three to five weeks. The advantages claimed for this operation are: First, that it is applicable in all forms of trachoma. Second, there is very little reaction.

Third, by this method of grattage the smaller granulations in the process of development are removed, as well as the large, and the after treatment with caustic applications is unnecessary. M. B.

## TUMORS.

Concerning Sarcoma of the Iris and Endothelioma of the Iris.—Wintersteiner, Vienna (*Graefe's Arch.* LXIX-II. 1, Aug. 28, 1908). This article is clinical, anatomical and critical. The important microscopic features in the case studied was that the growth was a cellular unpigmented neoplasm which had developed from the stroma of the iris but not from the stroma cells—the chromatophore as was shown by the absence of pigment, the arrangement of the cells in epithelial bands without intercellular substance, and the cylindrical form of the cell arrangement in a definite manner to the vessels. Besides this, there was at least, in a portion of the growth, a strong resemblance to an epithelial element, so that, it becomes necessary to consider whether in this growth we had to do with an epithelial new formation, a carcinoma or a mesodermal sarcoma or endothelioma. This is an important question as it bears upon the treatment and from the fact that two other eminent pathologists at first consideration deemed it an epithelial tumor. The question arises whether it is possible for a primary epithelial tumor of the iris to develop into a carcinoma. He believes that in this case the tumor did not develop from the clump cells. The peculiarity of the cells, their form and arrangement, which make one think of an epithelial growth, are common to tumors springing from cover cells of mesodermic origin —endithelioma. The growth was composed only in part of epitheleoid cells, in other parts of spindle cell-like connective tissue cells.

Further the epithelial-like cells contained fissures which could only be considered as lymph spaces. Finally, in some places the endothelial layer of the iris merged into the tumor mass in which the cell form of the normal endothelium of the serous covering of the iris was retained. All of these points warrant the assumption that the new growth was an endothelioma; and considering that in many places the type of cell formation was that in which the tumor cells surround the lumen of a vessel, i. e., a lymph space or lymph vessel or a very thin vessel wall, palisade like, it may be considered to be a perivascular endothelioma, or in other words, a perithelioma.

The author's conclusion as to the therapy of iris sarcoma are as follows:

1. The normal operation in carcinoma of the iris is enucleation of the ball.

2. Iridectomy remains in certain exceptional cases reserved where the conditions were particularly favorable. Consequently only those cases are to be considered where vision is still good and will continue to be serviceable after the operation, where the tumor appears to be limited to the iris and the performance of an iridectomy presents no technical difficulties. The mere technical possibility of removal of the tumor is not sufficient.

To be suitable for iridectomy the tumor must be circumscribed and free and located in the pupillary zone of the iris. Tumors which clinically appear to be limited to the iris but which reach to the chamber angle or fill it, or when they touch the cornea, or when in union with the lens, or when they do not possess a sharply defined outline, or in its neighborhood there are suspicious nodules or pigment spots, or when the iris has a diffused discoloration, or if increased T. has appeared, or when the tumor shows rapid growth are unsuitable for iridectomy. As, however, enucleation does not seem to prevent metastasis any more than does iridectomy, a time must be selected for the operation when it seems still possible to prevent local recurrence. W. Z.

Calcified Fibroma of the Orbit.—Roy, J. N., Montreal. (*Ophthalmoscope,* Jan., 1909). A boy, aged 14, developed at the age of 11 a tumor of the orbit at the naso-inferior angle. It was removed. Neuro-paralytic keratitis developed and the eye was removed. The orbital growth recurred and in 3 years time filled the orbit and caused distortion of the lids. Its removal was accomplished by eviscerating the orbit. After the orbit had healed the edges of the lids were partially united. No recurrence during the year which has followed. The growth was examined by Dr. Dupont, who reports it to be a fibroma containing numerous little centers of calcification scattered throughout the growth. M. B.

A Case of Pseudoleukemic Orbital Tumors.—Meller, J., Wien, (*From the eye clinic of Prof. Fuchs in the University* *of Wein. Zeitschrift fuer Augenheilkunde* XXI, 1909, p. 41), reports in detail the clinical history and postmortem examination of the following case of tumors of both orbits: A man, aged 57, who always had been well, excepting an attack of influenza in 1905, noticed in November, 1906, that his eyes commenced to swell. In January, 1907, M. found a considerable swelling of both upper lids, caused by the enlarged lacrimal glands and tumors behind the upper medial orbital margins. The skin was moveable, and there was no sensitiveness to pressure. The left eyeball was protruded, 1 cm, and displaced downward, and its motility very much reduced. In the edematous ocular conjunctiva numerous granules like sago were visible up to the limbus. Purulent infiltration of the lower half of the cornea (keratitis etlagophthalmos), iritis, hypopyon; fundus not visible. The condition of the right orbit was similar, but the right eyeball was perfectly normal; no exophthalmus.

The examination of the blood showed anemia and suggested an intense irritation of the bone marrow. All lymphatic glands of the body, liver and spleen, were enlarged. This general involvement of the body decided against the diagnosis of primary lymphosarcoma of the orbit and corroborated M.'s diagnosis of general lymphomatosis, (pseudoleukemia), with locally aggressive (lymphosarcomatous) character. The left eye was destroyed by panophthalmitis, and the treatment with arsenic had no effect on the orbital tumors and the general condition, so that the patient left the clinic in March.

He returned August 28th, 1908, with the statement that the tumor of the left orbit had grown more and more with ulceration and frequent profuse hemorrhages, but without pain. As illustrated by a colored picture, a soft tumor of the size of a large fist, with ulcerated, bleeding surface, protruded like a fungus from the left orbit, while the condition of the right eye, excepting a slight increase in the size of the tumors, had scarcely changed. The patient was anemic and cachectic and the swelling of the lymphatic glands all over had considerably increased, both tonsils were as large as eggs and blockaded the entrance to the pharynx. Toward the end of September the patient rapidly failed and died on October 3rd, 1908.

From the autopsy report, it suffices to mention that a section through the longitudinal axis of the tumor of the left eye, which was taken out with the whole contents of the orbit, showed a uniformly gray, partly red, moderately resistant, tissue, which substituted the whole contents of the orbit and the lids as far as the skin, but nowhere encroached upon the bone. The lymphatic glands of the. body were well defined and nowhere was the capsule penetrated. The process in the right orbit remained within the limits usually found in leukemic tumors.

M. sees in this case a confirmation of his views, propounded in several of his essays on the formation of tumors in the orbit in lymphomatous diseases, viz. that the lymphomatous infiltrations, starting from the conjunctiva: may also in those cases, in which nowhere in the body an aggressive growth exists, present an infiltration character and may, like sarcomas, finally fill the orbit and grow out of it. and that a sharp limitation of the proliferation of tissue is impossible from anatomical conditions. The consequence is that they, even in moderate growth, make the impression of sarcomatous, diffusely infiltrating, tumors, although the same process obtains, which in all other parts of the body (lymphatic glands, spleen) elicited only a typical confined hyperplasm. The histological examination of the right orbit revealed the participation of the lacrimal gland, repeatedly discussed by M., the parenchyma of which was almost entirely destroyed by the infiltration. Also in the left orbit the tumor started from the lacrimal gland. The histological conditions are illustrated. C. Z.

## *Book Reviews.*

**A System of Ophthalmic Therapeutics.—Wood, Casey A., M. D., C. M., D. C. L.,** being a complete work on the non-operative treatment, including the prophylaxis, of diseases of the eye. Illustrated and completely indexed. Published by the Cleveland Press, Chicago, 1909, Large cloth quarto, 926 pp. Price $6.00.

This monumental work by Casey A. Wood and seven well known ophthalmic authors, who have written special chapters therein, brings together a mass of material which hitherto has been scattered through various textbooks and hundreds of essays, many of them inaccessible to the ordinary student and practitioner of ophthalmology. In addition there will be found numerous observations throughout the work concerning medicines and methods which have been gleaned by the author from special observation and by correspondence with prominent oculists and writers, which would not ordinarily be called to the attention of a textbook or journal reader, and to these the author has added the personal and ripened observations of a most extensive experience, both as a practitioner and teacher of the subject. Search as you may through the tome, I doubt if you will find any phase of the subject untouched. The author's delightful style renders a somewhat dry subject easy and profitable reading.

Several of the special chapters contain new and interesting material, more especially those by Croftan on the conduct of internal diseases connected with ophthalmic affections; Hecht on treatment of affections of brain and spinal cord that involve the eye, and Coleman on electrotherapeutics; Bradley on the nasal sinuses and Irons on serum therapy; Peterson on anesthesia and Murray on the history of ophthalmic therapeutics are interesting. But the guiding hand of the author is seen in these special chapters as well as in the body of the book; his comments upon drugs or methods bearing the stamp of actual observation and personal experience. The work would cleanse the scales from the eyes of those who pin their faith to a few well tried and proven remedies and who do not accept new helps until forced upon them by their use by competitors. It is well to have such a book as this as a vade mecum, and as such it is the most complete in all languages and the only one of any pretension in the English. H. V. Würdemann.

**The Medical Annual: A Year Book of Treatment and Practitioner's Index.**—Published by John Wright & Sons, Ltd., Bristol; Simpkin, Marshall, Hamilton, Kent & Co., Ltd., New York. Price 8s. 6d.

This is the 27th year of the Medical Annual, a most complete epitome of the advances in medical science, during the last year; a heavy octavo of 756 pages of text, over 912 in all, printed on thin paper, containing numerous illustrations and plates, many of them colored. There have been 37 collaborators, all of them of world-wide renown, among whom may be found a number from America. This volume is especially interesting on account of the ophthalmic contributions, which have been edited by Ernest E. Maddox and J .Herbert Yearsley, and in proportion to the other portions of the book, fills a large part.

We note with pleasure that American Ophthalmic literature is freely represented and in many cases illustrated by plates and illustrations in the text. The same may be said of otology, rhinology, laryngology. The exerpts from the literature of 1908 are sufficiently full to allow of a style of writing which renders the subject as interesting as in the original, and these abstracts are so complete that in most cases the originals need not be consulted.

The profession is certainly indebted to the editors and publishers of the valuable compilation. H. V. Würdemann.

**Supplement to Vol. XLVII of the "Klinische Monatsblaetter fuer Augenheilkunde."**—Axenfeld, Th., Freiburg, i. Br., and Uhthoff, W., Breslau. 195 pp., with 6 partly colored plates and 16 illustrations in the text. Festival No. 184 to the anniversary of the 70th birthday of Hermann Schmidt-Rimpler, Stuttgart: Ferdinand, Enke., 1909.

Of the 21 articles, here presented, chiefly on subjects which more or less have some bearing on the numerous valuable contributions of Schmidt-Rimpler to ophthalmology, we can mention only a few, as the original deserves a closer study. In the first, "on the physiological importance of photography in natural colors and its value for the diagnosis of color blindness," E. Raehlmann, Weimer, gives a description of the new photography in natural colors, according to the lines of Jolly and the autochromatic plates of Lumiere Brothers. He shows that these photographs have the value of a physiological experiment on the subjective mixture of perception of colors from three ground color perceptions, and that the production of a mixed color in the eye by the three colored components of the autochromatic plates make Lumiere's photographs of colored objects useful for testing the color sense.

Hans Adler, Wien: "Thyreoidin in eye diseases," reports that in 8 of 16 cases of diseases of the uvea, with opacities of the vitreous, vision was improved by thyreoidin, and no deleterious influences were noticed under certain precautions, which are mentioned.

W. Uhthoff, Breslau, describes "a case of Keratoconus with autopsy," and attributes its cause to a pathological predisposition of the central portion of the corneal stroma.

R. Greeff, Berlin, "On my trachoma corpuscles," communicates his findings, reviewed under our abstracts in this number.

According to Th. Axenfeld: "Remarks on retinitis pigmentosa, especially without hemeralopia," all gradual transitions from the highest degree of hemeralopia to its complete absence may occur; the latter being very rare. The less the hemeralopia, the better the prognosis, as a slight disturbance of the light sense indicates the limitations of the disease to the atrophic pigmented area.

For the treatment of retinitis pigmentosa, A. recommends light grey antiultraviolet glasses.

R. Hausmann: "Report of 103 magnet extractions, from the eyeclinic of Prof. Schmidt-Rimpler at Halle."

H. Wiegels: "On injuries of the eye by pieces of copper, especially their spontaneous extrusion."

Joh. Guenther: "On injuries of the eye by gunshot."

In his remarks on sympathetic ophthalmia," Axenfeld reports a case of sympathetic detachment of the retina and a case of recovery of the injured and sympathetic eye, etc.

C. Zimmermann.

**Parenchymatous Keratitis.—Hoor, Carl, Prof., Budapest. Ophthalmological Essays, edited by A. Vossius. Vol. VII, Nos. 7 and 8, 124 pp. Halle a. S. Carl Marhold. 1909. 3 M. $0.75.**

H. discusses very exhaustively the clinical aspect, nomenclature, etiology, pathology, history, and treatment, of parenchymatous keratitis with a very complete review of literature and a bibliography. After quoting the opinions of various authors with regard to traumatism as eliciting cause of parenchymatous keratitis in general dyscrasias, H. says that this question cannot be answered in the affirmative and that in an individual case the question ought to be thus formulated: "Can we, with our present knowledge, exclude with certainty that an injury in general dyscrasia may create a local dyscratic process in form of parenchymatous keratitis?" We highly recommend the elaborate essay to our readers.

C. Zimmermann.

**Diseases of the Orbit.—Birch-Hirschfeld, A., Prof., Leipzig.** Graefe-Saemirch, Handbuch der gesamten Augenheilkunde. Second, entirely new, edition, Nos. 167 to 170, pp. 241 to 510, with 8 figures in the text and five plates. Leipzig: Wilhelm Engelmann, 1909. Subscription 8 M. ($2.00). The first part of H.'s important book was reviewed in Ophthalmology, Vol. IV, October, 1907, p. 191.

The present numbers discuss the inflammatory disease of the orbit. In an introduction on the anatomical conditions which are of importance for the inflammatory diseases of the orbit, B. devotes a special chapter to the veins and arteries of the orbit and their connections, with 3 splendid plates, and describes his own recent investigation on the lymphatic apparatus of the orbit, with the conclusion, that the orbit, like other parts of the body, contains a system of lymphatic vessels, which so far was not known.

The author shows how our views of the pathology, prognosis and treatment of the inflammatory affections of the orbit have changed, since by the collaboration of surgeons and rhinologists their dependence on diseases of the surrounding sinus of the nose have been so materially elucidated. Edema, periostitis, etc., of the orbit can not very well be considered as diseases per se, but usually are secondary affections. Consequently the inflammation of the orbit in inflammations of the accessory cavities of the nose occupies the bulk of the work. Out of 684 cases of B.'s collection 409 were due to inflammation of the neighboring sinus. In the following chapters the participation of the single sinus is discussed in detail, viz. the frontal, anterior, the posterior ethmoidal and sphenoidal, the maxillary sinus, finally the combined empyemas of the accessory sinus, with inflammation of the orbit, then the inflammation of the retrobulbar tissue, its multifarious etiological factors and its deleterious influence on the visual organ, chiefly by thrombophlebitis or thrombosis of the central retinal artery or by thrombulbar interstitial neuritis of the optic nerve, and toxic influences, its propagation to the brain through the veins of the cavernous sinus, perforation of the bones and metastasis. Vice versa the orbital complications in thrombosis of the cavernous sinus are considered in a special paragraph, finally syphilis, tuberculosis, actinomycocis, mallous, anthrax, tetanus, tenonitis and the inflammatory pseudotumors of the orbit. Under pseudotumors those affections are comprised which clinically appear as tumors, whose further course, (spontaneous subsidence, or by internal medication) or anatomical condition, however, show that they are not tumors proper. The etiology, pathology, symptomotology and treatment of the single affections are exhaustively given, with abundant casuistics, so that the elaborate work will prove a most practical and reliable guide in this important field. C. ZIMMERMANN.

**History of Ophthalmology.—Hirschberg, J.,** Berlin. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde. 2nd, entirely new, edition. Nos. 171 to 175, 380 pp., with 20 figures in the text and 3 plates. Leipzig: Wilhelm Engelmann, 1909. Subscription 10 M ($2.50).

In this volume H. gives an exhaustive, intensely interesting description of the personalities, works and achievements of the chief ophthalmic surgeons, cultivators, and knights errant, of ophthalmology of the 18th century. By numerous carefully selected quotations from their writings, many of which are not generally accessible, the author supplies a very complete and well arranged bibliography of that period and presents a very clear aspect of the foundation and development of the new ophthalmology in all countries. A most admirable feat indeed, as never before accomplished!

H. designates as the main fault of former histories of ophthalmology the assumption of discoveries where there were none, owing to the unfamiliarity with the Greek and Arabian canons. In comparing the new canon at the transition of the 18th century to the 19th century with the old Greek-Arabian, the most striking difference is that the ancients gave definitions, not descriptions, of eye diseases. Their tradition of the subject matter was rendered in a dogmatic form. In the new canon the old dogma of the doctrine of cataract was replaced by anatomical knowledge, reclination by extraction, the new operation for forming an artificial pupil was generally accepted, glaucoma, the Greek name for cataract, was gradually identified with the clinical picture of today, although increased tension was not clearly ascertained as its cause. New were the comprehension of iritis, the general treatment of interior ocular inflammations with mercury, and the local application of mydriatics. The influence of pathologic anatomy and physiology on retinal diseases is noticeable, the views on visual disturbances, amblyopia, hemianopsia, diplopia, were more developed. Those on anomalies of refraction began, the surgical treatment of diseases of the lacrimal passages was established.

H. concludes with the remark, that hundreds of single discoveries in the 18th century have added to the store of scientific ophthalmology. The progress of this century was greater than any of the former, at least since the Alexandrians, who built the old canon so imposingly upon very limited foundations. Portraits and pictures of eye operations, embellish the valuable work. C. ZIMMERMANN.

**Text Book of Ophthalmology.**—Axenfeld, Theodor, Professor, Freiburg i. Br., in conjunction with Professors L. Bach, Marburg; A. Heilschowsky, Leipzig; A. Elschnig, Prague; R. Greff, Berlin; L. Heine, Kiel; L. von Hippel, Heidelberg; E. Krueckmann, Koenigsberg i. Pr.; A. Peters, Rostock; O. Schirmer, Strassburg. 679 pp., with 10 colored plates and 455, mostly colored, illustrations in the text. Gustav Fischer, Jena, 1909. 14 M. ($3.50). Bound, $3.75.

This, in the best sense, modern text-book, has some novel features. In the first place it is written by a number of authors who, by their original investigations and previous publications have become famous in their respective fields. Then it contains some chapters which are not found in the text books, e. g. introduction into the treatment of eye diseases, by Axenfeld; injuries, sympathetic ophthalmia and indemnity, by O. Schirmer; opthalmoscope differential diagnostics, by A. Elschnig; embryology and congenital anomalies, by E. von Hippel; general diseases and eye symptoms, by L. Heine. The examination of the eye, by Axenfeld, and the functional tests, by L. Heine, are more exhaustive. Disturbances of motility and anomalies of position are by A. Hielschowsky, diseases of the lids by E. von Hippel, of the lacrimal organs by O. Schriner, the conjunctiva by T. H. Axenfield, the cornea by A. Elschnig, the uvea by E. Kruechmann, the lenses by L. Bach, the retina, optic nerve and visual path by R. Greeff, lymph circulation and glaucoma, diseases of the orbit by A. Peters.

There is an unusual abundance of excellent illustrations, including pathologic anatomy, technic of examination and treatment. Print and paper are of superior quality, and orientation is greatly facilitated by the use of different sizes of type.

C. Zimmermann.

**Gynecology and Obstetrics in their Relations to Ophthalmology.— Runge, Ernst,** Assistant at the Gynecological Clinic in the Charite at Berlin. 164 pp. Leipzig: Johann Ambrosius Barth, 4.25 M. ($1.05).

The author gives an excellent synopsis of affections of the single parts of the eye, arranged in anatomical order: lids, conjunctiva, cornea, etc.; glaucoma, amblyopia, amaurosis, refraction and accommodation, under the following sections: menstruation, puberty, climacterium, local genital diseases, masturbation and sexual intercourse, chlorosis, Graves' disease, pregnancy, labor, puerperium, lactation, infectious processes, hemorrhages. Each section is introduced by a general review, e. g., in the first, the influence of normal menstruation and its disturbances, amenorrhea, dysmenorrhea suppression, on almost all organs of the female body is emphasized. This will be less noticeable on normal eyes, but even slight affections of the eye, existing in the intermenstrual period, will be aggravated, others may relapse. Disturbances of circulation, toxines, reflexes must be considered as the etiological factors, but the possiblity of hysteria must not be neglected. The onset of menstruation at the age of puberty, with insufficient voidance of blood before the development of the regular menstruation type may cause similar ocular affections as amenorrhea, especially if combined with chlorosis or scrofulosis.

The greatest number of eye diseases occur in climacterium, caused by disturbances of circulation from plethora or profuse hemorrhages.

Under pregnancy the affections of the kidneys with subsequent albuminuric retinitis and uremic amaurosis are given especial attention, then the ocular affections during the puerperal state and lactation, chiefly owing to lack of nutrition, metastatic ophthalmia, septic retinitis, etc., from infectious process, amblyopia and amaurosis from anemia of the retina, lymphatic stasis in the sheaths, and degeneration of the optic nerve, toxin disease of the vascular walls after genital hemorrhages.

The two last chapters discuss the injuries of the eyes of the child in normal and artificial labor, and ophthalmo-blennorrhea neonatorum and its treatment. The literature is very conscientiously utilized, with a bibliography of 784 numbers. Paper and print are very good. C. ZIMMERMANN.

**Essentials of Medicine: A Text Book of Medicine for Students Beginning a Medical Course, for Nurses and for all others interested in the care of the sick.—Emerson, Charles Philips, M. D.,** late resident physician, the John Hopkins Hospital, and Associate in Medicine, the John Hopkins University. Philadelphia and London: J. & B. Lippincott & Co. Price 8s. 6d. net.

This work of nearly 400 pages, forms in reality a discussion of diseases along with physiology and pathology. It treats of the subject in a simple and attractive manner for students, nurses, and even for the lay reader who may desire to understand something of medical problems.

For the latter, it attempts to serve the needs of the lay reader, better than the usual type of family physician books which he usually consults when curiosity, need or a desire to criticise his medical attendant's efforts arises in him. In this respect it succeeds, unless the lay reader be not sufficiently educated to assimilate the fund of information the author gives. For students and nurses the book will be found extremely useful, especially the former, in that it puts before them in a very attractive form, a picture of the diseases with their physiology and causation which cannot be obtained in the usual students text books.

The author has an attractive style, does not labor his descriptions with long words, obscure scientific terminology and yet manages to convey a rich supply of important facts which the student must learn if he desires to become a successful practitioner. The work can be read with decided advantage by the qualified man as on nearly every ailment, points of interest will be found, especially regarding physiology, and when such a work is written from a novel and easily read point of view its perusal will be a pleasure as well as a benefit. It is a work which one could read as a relaxation and yet be gaining useful knowledge, and on certain occasions could be put into the hands of the patients themselves. C. ZIMMERMANN.

**The Commoner Diseases of the Eye: How to Detect and How to Treat Them.—Wood, Casey, M. D., C. M. D. C. L.,** Prof. of Ophthalmology, Northwestern University, Ophth. Surgeon to St. Luke's Hospital and Wesley Hospital, Chicago, ex-Chairman of the ophthalmology section Am. Med. Association, formerly President of the American Academy of Ophthalmology and Otolaryngology, and **Woodruff, Thomas A., M. D. C. M., L. R. C. P. (Lond.),** Oph. Surgeon St. Luke's Hospital and Otolaryngology. 589 pp., 280 illustrations (many original) and four Am. Med. Association; Fellow of American Academy of Ophthalmology and Otolarygology. 589 pp., 280 illustrations (many original) and four colored plates. Third edition, enlarged and improved, with index. London: Henry Kimpton, 13 Furnival Street, Holborn, E. C. Glasgow: Alex. Stehouse, University Avenue.

In Chapter 27 occurs the following statement: "How few medical men intelligently employ the ophthalmoscope in the various forms of the so-called Bright's disease, and in suspected brain tumors few make use of the perimeter; how few even determine the visual powers of the patient with test types? How few learn the many lessons taught by even simple inspection of the eye?" It cannot be too much or too often insisted upon that these means of arriving at a diagnosis are not the especial property of the ophthalmologist; they belong to the student of medicine in exactly the same sense and for the same reasons that does the stethoscope, the sphygmograph or the haemometer." However the author's remark in the preface that "The acquirement of even a moderate degree of knowledge, respecting diseases of the eye, especially those requiring the use of the ophthalmoscope, necessitates considerable study and frequent chances for observation. The everyday routine of general practice, affords neither opportunities for the one nor time for the other." These two statements seem to contradict one another and the authors further say: "There is a fairly well defined and important group of diseases, affecting various parts of the visual apparatus, whose signs and symptoms are especially prone to be overlooked or misinterpreted by the general practitioner simply because he has abandoned the inspection of the eye." Their extracts from their book of themselves prove what a difficult task the authors have undertaken in endeavoring, as they put it, to produce a work on "ophthalmology from the standpoint of the physician in general practice." The practice of Ophthalmology is essentially the province of the specialist, and its conduct by the busy general practitioner is so limited that a work of this size written especially for such is apt to be superfluous.

If, however, it be considered as written for the student who is nearing the end of his educational career it will be found to have real value, for it goes sufficiently deeply and yet without superfluity of technical terms as to make its information easy of assimilation. Chapter 15, "How to preserve the eyesight," and Chapter 23 on "Remedies commonly used in ophthalmic practice," will be found of practical value. The addition of a chapter on "The commoner relations of nasal and neighboring cavity disease to the eyes" is a feature of especial value in an ophthalmic work and fills a gap which is general conspicuous by its absence in similar treatises. As the work has seen three editions, it evidently supplies a demand and hence justifies its publication. A. A. Bradburne.

**Atlas and Epitome of External Diseases of the Eye. Third Revised Edition. Atlas and Epitome of External Diseases of the Eye.—Haab, Dr. O.,** Prof., of Zurich. Edited, with additions by George E. deSchweinitz, M. D., Professor of Ophthalmology, University of Pennsylvania. Third revised edition. With 101 colored lithographic illustrations on 46 plates and 244 pages of text. Philadelphia and London: W. B. Saunders Company, 1909. Cloth, $3.00 net.

This manual is intended to represent clinical material as seen at his clinic; illustrations being given on each disease of the eye, which is followed by descriptive text relating to the illustration in question. These illustrations consist of 46 plates, some of which have two illustrations on each plate. The illustrations are all more than ordinarily accurately drawn.

We all realize that it is one of the hardest tasks undertaken by the publisher to produce plates of external diseases of the eye that would accurately show the condition of the disease as it appears to the clinician. While these cuts will never replace actual experience with clinical material, nevertheless, they will be of valuable aid both to the ophthalmic student and the teacher who desires a compact, neat and accurate manual for his pupils.

The illustrations of diseases of the cornea are unusually well shown. This is really one of the hardest tasks that a publisher has to contend with. The text of this manual is short, concise, to the point, and lacks the flourish which we find in so many books that are published, which is of no material benefit other than to occupy space and enlarge the book. This manual should find a space among the students of all ophthalmic teachers.

A. M. MacWhinnie.

## NOTICE.

The editorial staff and publisher of "Ophthalmology" desire to express their thanks to Dr. Frank Allport and Dr. Paul Guilford for the editorial help and contributions that have been given since the first issue of our journal, and to express regret that owing to other arrangements their editorial connection with this journal has been discontinued.

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## ERRATA.

The following errata appeared in April, 1909, Vol. V., No. 3, in the article by Dr. John Green, Jr.

Page 436, line 8, "indusive," should be "intensive."

Page 436, line 20, the word "restoration" should be "resorption."

Page 436, line 8 from the bottom, "hystemical" should be "hysterical."

Page 436, line 3 from the bottom, the letter "M" has been omitted from the word "Many."

Page 440, 10 lines from the bottom, "potency" should be "patency."

Page 440, 4 lines from the bottom, after the name "H. C. Parker," there should be a period and the next sentence should begin with "Posey."

Page 443, 18 lines from the top, the word "by" should be "but."

Page 444, 6 lines from the bottom, the word "infinite" should be "definite."

Page 447, 18 lines from the bottom, the word "detention" should be "dentition."

Page 448, 15 lines from the top the word "onerous" should be "enormous."

The International American Congress of Medicine and Hygiene of 1910 will take place in the city of Buenos Aires in the month of May 1910 in commemoration of the First Centenary of the May Revolution of 1810 under the distinguished high patronage of His Excellency the President of the Republic, Dr. Figuefoa Alcorta. The Executive Committee has for its President Doctor Eliseo Canton, Dean of the Medical Faculty in Buenos Aires and for General Secretaries Doctors Luis Agote and Pedro Lacavera, Professors of the same.

The Congress is of an international American character, the government and scientific men of the three Americas being invited.

The Congress is divided in the following sections:

1.ª *Biological and fundamental matters.*—Bacteriology, General and Experimental Pathology, Descriptive Topographical, Pathological Anatomy, Physiology, Embriology, Histology, and Parasitology.

2.ª *Medicine and its clinics.*—Medical, Therapeutical, Semeiological, Pedriatical, Nervous and Mental clinic, Criminal Anthropology, Epidermology, Dermathology, and Syfology.

3.ª *Surgery and its clinics.*—Surgical clinic, oto-rhino-laringological clinic, Infantile Surgery, Ophthalmology, Gynaecology, and Genito-Urinaria.

4.ª *Public Hygiene.*—Public Hygiene, Dermography, Sanitary Organisation, Legal Medicine, International Sanitary Prophylaxis, Industrial Hygiene, Naval Medicine and Surgery, Military Medicine and Surgery, Scholastic Hygiene, Tuberculous Dermography, Tuberculous Statistics and Social Defense.

5.ª *Pharmacy and Chemistry.*

6.ª *Sanitary Technology.*—Engineering and architectonie Sciences as applied to Hygiene.

7.ª *Veterinary Police.*—Contagious diseases, Veterinary Medicine.

8.ª *Dental Pathology.*

9.ª *Exhibition of Hygiene.*

Each one of these sections can be subdivided in two or more, if necessary or on the other hand two or more may be joined into one.

Members of the Congress are Medical men, Pharmaceutical Chemists, Dentists, Veterinary Surgeons, Engineers, Architects and all other professionals connected with the different sections of the Congress or who express to the Executive Committee their adherence in writing. Adherence can be procured also by paying the sum of One Pound Sterling or Five Dollars Gold, especially those who desire later on to receive the publicationstions and comptes-rendus of the Congress.

The papers for the Congress will be received only till the first of January, 1910, and if more convenient only the titles accompanied by a small extract in order to give facilities for the organization in time of the sections of the program.

The official languages are Spanish, French, Portuguese and English.

The Executive Committee has solicited from the National and Foreign Companies of Transport especial Rates for the members of the Congress and their families.

The official program of the Congress has been supplemented by another of festivities, excursions, visits to public establishments, etc., as is usual in these cases. Very probably these latter will be of an especial brilliancy, taking into account that the date of the Congress coincides with the solemn commemoration by the Argentine people and government of the First Centenary of the historic May Revolution of 1910.

The secretary (Medical Faculty of Buenos Aires) will send to anyone who solicits them, the bulletins, programs, forms of membership, etc., and all other particulars about the Congress.

The General Secretaries.

## PROJECT OF THE EXHIBITION OF GENERAL HYGIENE FOR 1910

The "General Exhibition of Hygiene" will be opened in the city of Buenos Aires in May, 1910.

The "General Exhibition of Hygiene" will be universal with reference to the exhibits in connection with hygiene and international with reference to its attendance.

The "General Exhibition of Hygiene" will be divided with reference to its attendance and its competition for prizes in the following manner:

1st. National Competition.
2d. International Latin American Competition.
3d. General Competition.

The competitors in the national competition will be the exhibitors of the Argentine Republic with exhibits produced and manufactured exclusively in the country.

The competitors in the International Latin American competition will be those of all the Latin-American nations with exhibits produced or manufactured exclusively in their respective countries.

The competitors in the General Competition will be those of all other nations of the world and of the Argentine Republic and the other Latin American Nations who in an especial way manifest their desire to enter in it.

The competitors of the Argentine Republic with exclusively national products and those of Latin America in the same conditions will receive the necessary space for their installations covered and free of charge. The installations will be at their own expense.

The competitors of the other nationalities will receive the space necessary for their installations free of charge and in case they need covered space, such will be at their own expense.

The exhibition will be eminently practical and will occupy an extensive piece of ground with easy and frequent access, sufficient for all the installations and customary accessories in these exhibitions.

The Exhibition will close on the ..............of 1910, and within the following forty days the Exhibition premises must be disoccupied.

(This is a copy of the general Program which will be supplemented by the regulations and the detailed program with the classification of the exhibition and of the exhibits.)

## ACCURACY IN THERAPEUTICS.

The efficiency of a medicinal agent cannot be determined by mere physical appearance. Two specimens of fluid extract of digitalis, for example, may look precisely alike. One, upon administration, may exhibit a wholly satisfactory therapeutic action; the other, given under precisely the same conditions, may prove to be practically inert. Lack of uniformity in the crude drug, and absence on the other hand of an adequate method of assay, account for the singular discrepancy. And this serves to show the necessity of standardized remedial agents if we would proceed in the treatment of disease with any assurance of success. It emphasizes, too, the futility of trusting to chance that the extract of a crude drug contains what the practitioner supposes it to contain and what it ought to contain.

It is a healthy sign that manufacturers of medicines—some of them at least—are giving serious thought to this matter of standardization. It is cause for gratulation that the largest producers of medicinal products in the world consider the subject of sufficient importance to make it the basis of an expensive promotion campaign. We have in mind a series of announcements which have been published from time to time in practically the entire medical press of the country, the latest appearing under the significant title, "Who is the Keeper of Your Reputation?" In their plea for greater accuracy in therapeutics Messrs. Parke, Davis & Co. are doing vastly more than to exploit the products of their manufacture—they are rendering a lasting service to medicine.

It is to the physician's own interest, and to the interests of his patients, to prescribe standardized preparations; to provide himself with the most trustworthy agents that the market offers. The best is none too good for his purpose.

## THE MEDICAL ERA'S GASTRO-INTESTINAL EDITIONS.

During July and August The Medical Era of St. Louis, Missouri, will issue its annual series of issues devoted to gastro-intestinal diseases. The July number will take up the usual bowel disorders of hot weather and the August will be devoted entirely to typhoid fever. These issues always attract considerable attention. The editor will forward copies to physicians applying for same.

The Chicago Eye, Ear, Nose and Throat College has completed the new annex, 204 East Washington Street, adjacent to the hospital, 206 East Washington Street. This annex doubles the capacity of this progressive institution. A house physician is appointed in June and December, time of service one year.

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